

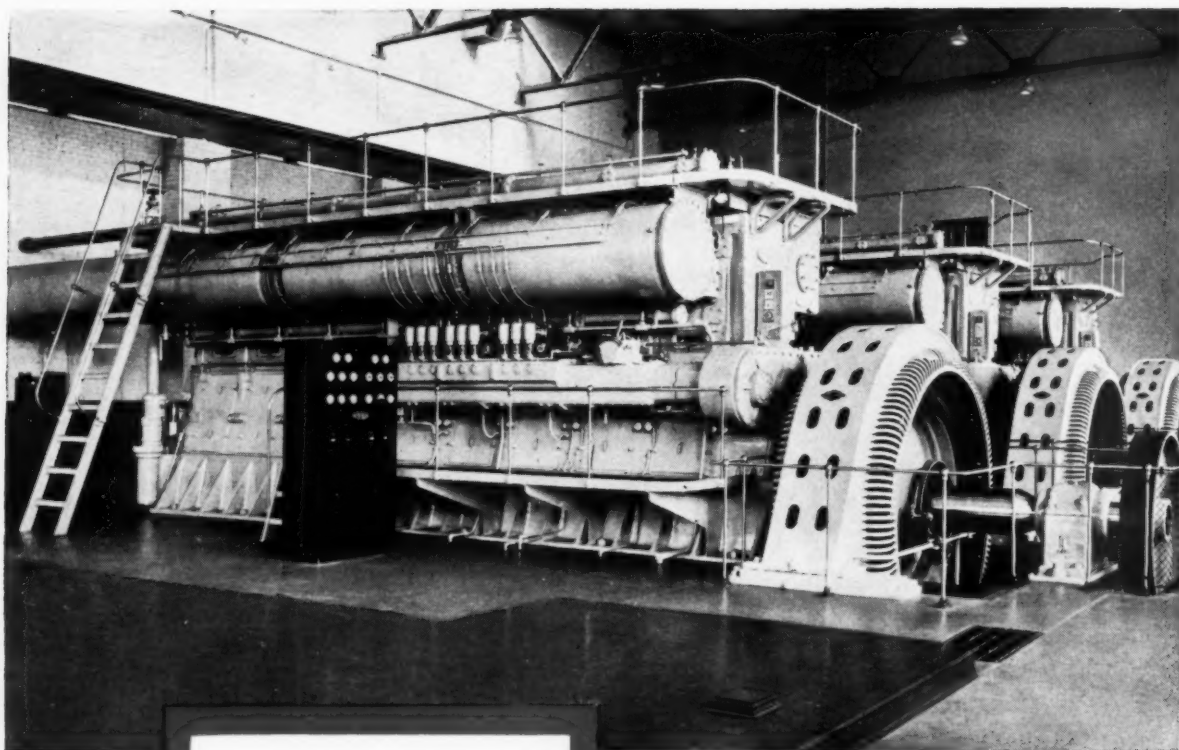
INDUSTRIAL

PROGRESS



APRIL, 1946

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TEXACO Ursa Oils

FOR ALL DIESEL ENGINES

TUNE IN THE TEXACO STAR THEATRE WITH JAMES MELTON EVERY SUNDAY NIGHT—CBS

DIESEL PROGRESS, for April, 1946. Volume XII, Number 4. DIESEL PROGRESS is published monthly by Diesel Engines, Inc., 2 W. Forty-fifth St., New York 19, N. Y. Rex W. Wadman, President. Acceptance under the Act of June 5, 1943, at East Stroudsburg, Pa., authorized March 27, 1940. Subscription rates: \$5.00 per year, single copy, 50c.

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DIESEL *and* GAS ENGINE PROGRESS



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FRONT COVER ILLUSTRATION: View in General Motors' Electro-Motive Division Shop showing the "Trucking Operation"—lowering the cab assembly with Diesels and generators installed on the trucks. The cab unit weighs about 300,000 pounds.

TABLE OF CONTENTS ILLUSTRATION: The "Wayne H." of Paducah, Kentucky, being repowered with an 8-cylinder, supercharged Cooper-Bessemer Diesel. The 32-ton Diesel is seen on its side just before it was slipped into the machinery space.

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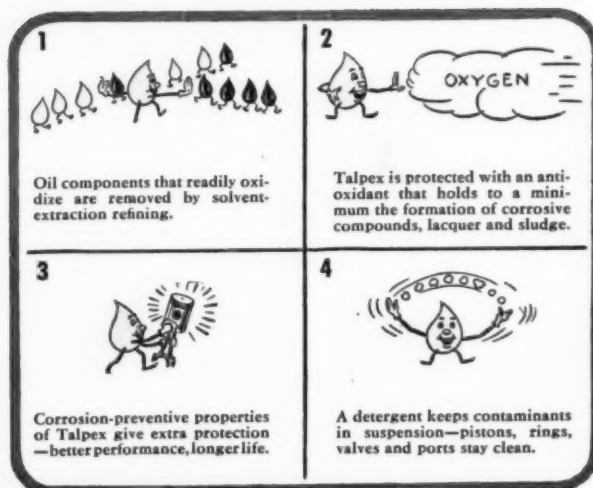
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SHELL DIESEL LUBRICANTS



DIESEL TOWBOAT

“CODRINGTON”

FOR about four years all classes of shipbuilding and shipping have been so controlled by the Government that new privately constructed and owned vessels of substantial size have been almost as “rare as hen’s teeth.” Now they are “on the go again.” Among the first units to join the postwar river fleets is the new Diesel towboat *Codrington* and integrated units of barges built under contract by the Nashville Bridge Company, Nashville, Tennessee, for the Cleveland Diesel Engine Division of the General Motors Corporation and acquired by the Canal Barge Company, New Orleans, La., for its oil-carrying service.

Although the trials of this fine modern craft were only run in January, she already is engaged in her regular duties on the Ohio and Mississippi Rivers where she has inaugurated a barge transportation movement on a route which is approximately a thousand miles each way.

Following preliminary builder’s tests, the acceptance trials took place on January 10, and consisted of a 40 mile run down the Cumber-

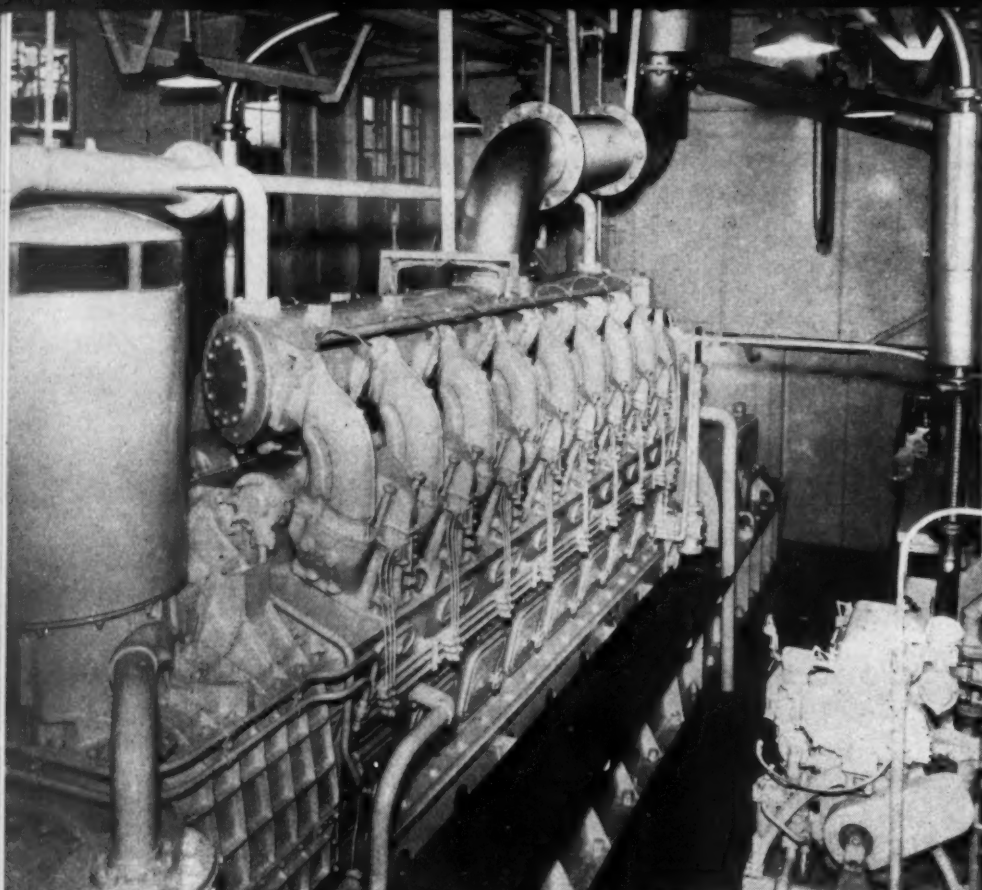
land River pushing two 20,000 bbl. capacity steel oil barges to a point where the company officials were put ashore. The test took place without a hitch, and everyone aboard appeared to be fully satisfied with the performance. The towboat then proceeded on her way to her operating base to take aboard a load of crude oil for her maiden voyage to a distant refinery.

While transportation of petroleum by water is age old, there was comparatively little carrying of crude oil and refined products on the Mississippi River and its tributary waters prior to the early 1930’s. With the development of proration legislation for oil fields, which limited well output; with the decline and fluctuation of prices, and with the imposition of heavy taxes and other restrictive petroleum laws, the cost of oil transportation became a serious problem to oil companies because of its effect on net profits. Naturally towboat reliability, economy and efficiency became very important factors in the transportation of oil by barge. The selection of types of towboat power, as well as the selection of particular makes of machinery were and are very important because

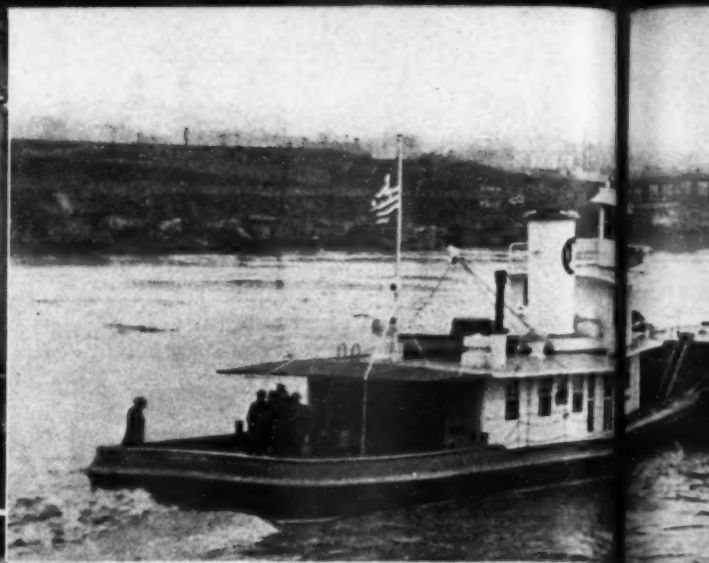
of their direct bearing on efficient service and their relation to the commercial success of overall operating plans. The Canal Barge Company was one of the pioneers in the adoption of new methods and techniques for river towing, and also one of the first to engage in hauling gasoline and other light oils on a contract transportation basis in the lower Mississippi territory.

Between 1930 and 1941 the U. S. engineers embarked on a broad program of inland waterway improvement. Many existing rivers were improved and new canals opened to aid navigation and to assist in greater use of inland water transportation. Then followed the construction by the oil industry of necessary bulk terminals at strategic points capable of handling large quantities of crude and refined petroleum. As terminals were constructed for handling petroleum products along the inland waterways, facilities for the transportation thereof grew steadily. Formerly the method of towing barges owned by the oil companies was neither satisfactory nor very economical, especially as most of the motive power was steam. Barges would be dropped at terminals along the routes and then unloaded by whatever pumping facilities were available. Having no power of their own, the barges would remain there idle until another tug came along to tow them back to the starting points.

To overcome this situation, the Canal Barge Company undertook to organize and develop integrated transportation units consisting of specially built barges, specially developed tugs and towboats and likewise specially developed pumping facilities. The first step involved the



Main engine of "Codrington," a 16-cylinder, "V" type, 1,235 bhp. General Motors Diesel; right fore-mounted 30 kw. auxiliary.



View of "Codrington's" spacious pilot house showing twin rudder arms and pneumatic engine control mounted as single unit.

design, development and construction of a barge that was specially suited for this type of operation and which would secure maximum efficiency not only through the speed with which it could be moved but also through the speed with which it could be unloaded so as to make it available for further operations.

This new barge embodied several innovations. It was a welded shell barge, whereas most barges then in use were either wooden or riveted steel. The bottoms were not flat but of a sort of V type with a six inch dead rise, which tended to deflect submerged logs and similar debris instead of permitting it to pass under the tow until it fouled the towboat propeller. This new type of bottom also made possible an internal construction that provided a well towards which the liquid contents of the barge gravitated so as to make possible a much more rapid and complete "stripping" or unloading of the barge. Thus the speed of movement, with the same power and fuel consumption, was increased.

In 1938 the General Motors Corporation collaborated with the Canal Barge Company, and designed a Diesel driven towboat which formed the prototype of the new vessel *Codrington*. Completed in 1939, she was named the *Bull*

Calf, and—it is interesting to mention—this vessel contained the first Air-Flex clutch-coupling and the experience and knowledge gained from her formed the basis for the Diesel engine plant of the war built LST's. The *Bull Calf* was smaller and had less power than the *Codrington*, being 88 ft. long and powered with a 750 hp. General Motors Diesel engine, and her service performance has more than justified the larger and more powerful vessel being

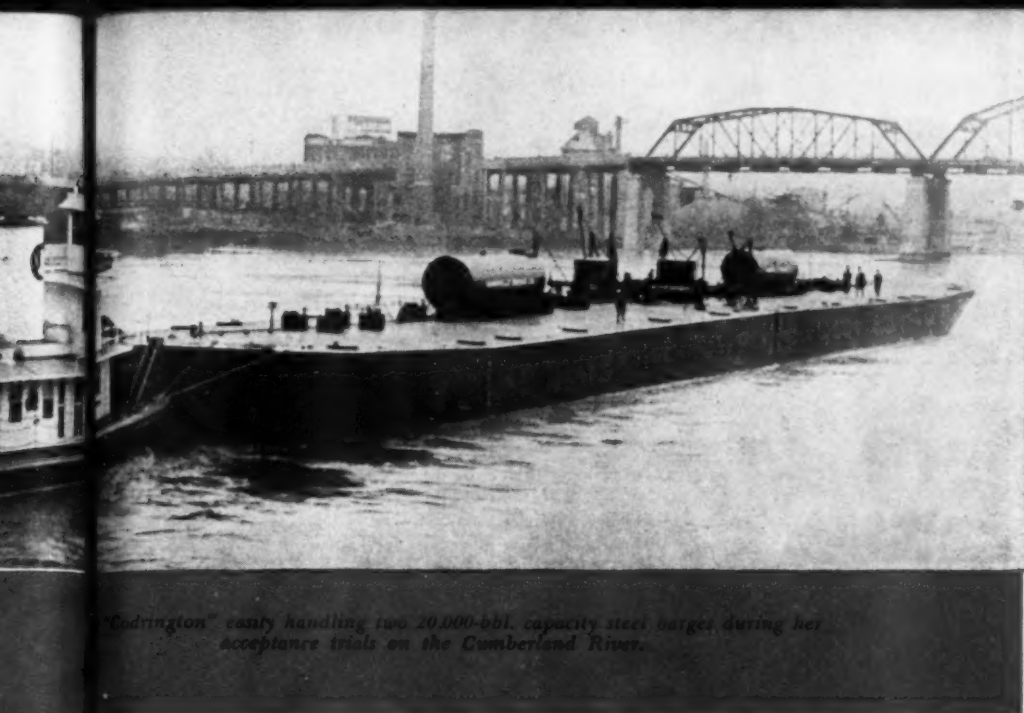
built along similar lines but capable of a much greater tonnage haul.

From the standpoint of river hauling the *Codrington* is noteworthy. She is a fine example of postwar shipbuilding, and her power plant is a modern engineering achievement. Everything has been done to improve efficiency in conjunction with an increase in overall simplicity. It is only necessary to watch the cap-

tain hand propeller note the to realize over the tow length steering in plished with

Named a President, towboat is 9 in. over 9 in. max amidship. aft it is 9 the towboat the steel fating are o barges close prevent up the two bar fit into sock the side thr

Propelling a 16-cylind Engine of 1,235 bhp. a to an Air-F and a reduc two constr which provi between the drums moun of the gear are selective tion of the ment of the late both c is accomplis



"Codrington" easily handling two 20,000-bbl. capacity steel barges during her acceptance trials on the Cumberland River.

tain handle the combined steering engine and propeller controls in the pilot house, and to note the instant response of the ship, in order to realize how much has been accomplished over the old steam stern wheeler. The total tow length, including the tug, is 591 ft., yet steering in the narrow river seems to be accomplished with the greatest of ease.

Named after George W. Codrington, Vice President, General Motors Corporation, this towboat is 110 ft. long, moulded, and 111 ft. 3 in. overall, with 26 ft. moulded beam; 26 ft. 9 in. maximum breadth, and 9 ft. 4 in. depth amidship. The sheer forward is 2 ft. 2 in. and aft it is 9 in. The hull and superstructure of the towboat is of all welded construction, and the steel fabricating workmanship and outfitting are of A-1 quality. Length of the two barges closely coupled together is 480 ft. To prevent up-and-down rubbing and wear where the two barges are connected, two 6½ in. pins fit into sockets, while heavy rubbing plates take the side thrust.

Propelling plant of the *Codrington* consists of a 16-cylinder, General Motors Marine Diesel Engine of the two-cycle type rated to deliver 1,235 bhp. at 700 rpm., and this unit is coupled to an Air-Flex clutch and reversing mechanism and a reduction gear. This reversing unit has two constricting type air-operated clutches which provide flexible and resilient connection between the engine fly-wheel and the driving drums mounted at the forward, or engine end, of the gear unit. The rubber clutch glands are selectively inflated to obtain desired rotation of the propeller shaft. Under the arrangement of the air control it is impossible to inflate both clutches simultaneously. Reversing is accomplished through bevel pinions, and as

astern and ahead reduction ratios are identical, full power and torque are available in both directions.

The main G.M. Diesel engine of the *Codrington* is of V-design with port scavenging-air inlets and valve-in-the-head exhaust outlets. Scavenging is carried out by means of a blower mounted at the forward end of the engine which draws its air supply through a silencer and delivers it under low pressure to the combustion chambers. The blower consists of a pair of triple helical-lobed rotors in a closely fitting housing, but without actual metal-to-metal contact, and the design allows a continuous and uniform displacement of air. From the space between the inner and outer wall of the blower housing, the air passes into the air box around the cylinder liners, and into the cylinders when the pistons uncover the ports.

The size of the propeller of the towboat is limited by her draft and by the size of the tunnel in which it turns. It is a three-bladed wheel of 82 in. diameter. At full speed the main engine rotates at 700 rpm. and the propeller at 304 rpm. To increase the effective thrust and with a view to reducing any tendency for the tunnel and propeller to become clogged with driftwood, a special semi-nozzle has been installed in the after end of the tunnel. The latter is in the shape of a Venturi throat, being narrow at the after end. Rubber bearings carry the propeller shaft.

For auxiliary power and electric light, there are two three-cylinder Model 3-71 General Motors Diesels, which drive 30-kw. direct current generators. Forward of the engine room there is a workshop equipped with sufficient tools to carry out minor repairs. In this space

are located two air compressors, belt driven by the motors, and equipped with magnetic control. These units provide air for starting the Diesels and maneuvering them, as well as for the Air-Flex clutch and for the operation of the pilot house control gear and the rudder engine. There also is installed a bilge pump driven by a 15 hp. electric motor.

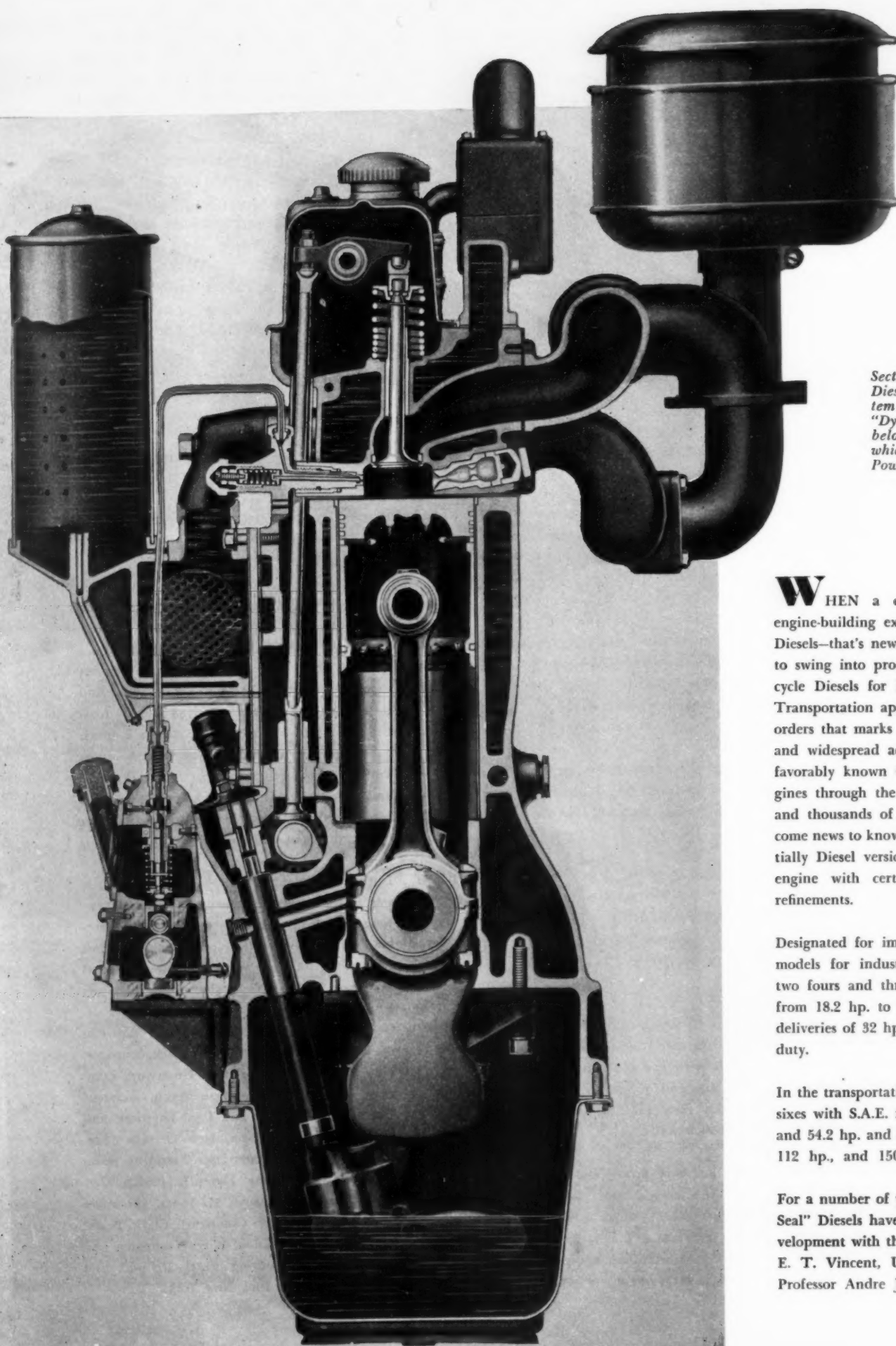
The pilot house control gear of the *Codrington* was designed by Harry Dyer, President of the Nashville Bridge Company, and was manufactured and assembled at the shipyard. It is actuated by a 9 hp. air motor, and, together with the various indicating instruments, is arranged in a single-unit stand or console, with the instruments and gauges mounted flush in its sloping top. All levers, including the twin rudder arms, are conveniently arranged in front of the pilot.

The forward part of the upper structure of the towboat below the pilot house houses the officers' accommodation and has a lounge or spare room. Aft of the lounge are two cabins with toilets and shower for the captain and pilot respectively.

The engineers' and mates' quarters below those of the captain and pilot are also modern, insulated and heated. There are the two two-berthed cabins with shower and toilet between them. Right aft is the combination galley and mess room. Food service is given directly from the hot tables, oil-fired range, etc., to a lunch counter, which facilitates service by the cook. Forward of the galley are quarters for the cook and deck hands. On the deck above the galley is a riveted steel rowboat equipped to take an outboard motor, and handled by a derrick.

During the trial runs Captain R. R. Thorpe was at the controls. Present at the trial runs were the following representatives of the Cleveland Diesel Engine Division, General Motors Corporation: George W. Codrington, General Manager; Thomas E. Hughes, Sales Manager; Knut O. Keel, Chief Engineer; Benjamin H. Gommel, Commercial Sales Manager; John Kitco, Engineer; Theodore L. Meckbach, Manager, New York Office; Charles G. Gustavson, Engineer, New York office; Dan Smith, Resident Engineer at Nashville and Trial Engineer; and C. L. Barnard, Manager, New Orleans office. Also present were: Harry Dyer, President, Nashville Bridge Company; Harry B. Jordan, German Jordan and Joseph M. Jones, executives of the Canal Barge Company; Clark Berry, purchasing agent, Canal Barge Company; and R. B. Cook, consulting naval architect and member of Tams, Inc., New York.

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Section through Continental Diesel showing fuel injection system and arrangement of the "Dyna-Cell," to the right of and below the valve—the effect of which produces "Cushioned Power."

WHEN a concern with 44 years of engine-building experience launches a line of Diesels—that's news! Yes, Continental is ready to swing into production on its line of four-cycle Diesels for Industrial, Agricultural and Transportation applications with a backlog of orders that marks these engines for immediate and widespread acceptance. Those who have favorably known Continental "Red Seal" engines through the years are legion. To them and thousands of power users it will be welcome news to know that these engines are essentially Diesel versions of the basic "Red Seal" engine with certain recognized engineering refinements.

Designated for immediate production are five models for industrial and agricultural uses—two fours and three sixes with S.A.E. ratings from 18.2 hp. to 54.2 hp. and observed shaft deliveries of 32 hp. to 116 hp. for intermittent duty.

In the transportation line are three models, all sixes with S.A.E. ratings of 38.4 hp., 44.6 hp., and 54.2 hp. and maximum outputs of 86 hp., 112 hp., and 150 hp. for the bare engines.

For a number of years these Continental "Red Seal" Diesels have been under design and development with the able assistance of Professor E. T. Vincent, University of Michigan, and Professor Andre J. Myers, University of Ken-

NOW . . .

CONTINENTAL "REDSEAL" DIESELS

Continental Announces Its Line Of Diesels Including Industrial, Agricultural And Transportation Types

lucky who have acted as consultants for Continental since 1930. Inherent in the physical make-up of these Diesels are all of the usable and long-proven features of former "Red Seal" engines to which has been added an improved type combustion chamber known as "Cushioned Power."

In this system air is drawn in through the intake manifold and valves, as in a gasoline engine, and is compressed in a special "cushioned" combustion chamber having approximately a 15 to 1 compression ratio. This "cushioned" combustion chamber consists of two compartments, the turbulence chamber and the "Dyna-cell." The "Dyna-cell" cushions peak pressures thereby reducing the noise and it stores the explosion energy momentarily. The turbulence chamber, which is the cylindrical portion directly below the exhaust valve, concentrates the charge of air around the fuel spray and produces a swirl that creates a more homogeneous mixture. The compression pressure produces enough heat to self ignite the fuel when it is injected into this hot air just before the piston reaches the top of its travel. The design is such that when the fuel is injected under moderately high pressure and at a definite rate, a portion becomes atomized and starts to burn first in the turbulence chamber. Also a definite quantity is directed into the "Dyna-cell" where burning follows, peak pressure develops and considerable energy is actually stored. This peak pressure is absorbed by the structure of the cell rather than being transmitted directly through the piston onto the bearings when the crank is in an unyielding position near top dead center. An instant later, however, this high pressure is released on the power stroke at a predetermined rate through the metered opening of the "Dyna-cell" into the main chamber. It is released in a direction which avoids blasting the nozzle as well as torching the top of the piston and in a manner which causes great turbulence resulting in complete combustion and a clean exhaust. Con-

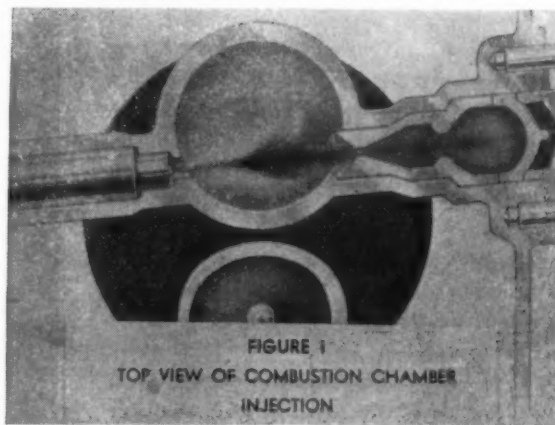


FIGURE 1
TOP VIEW OF COMBUSTION CHAMBER
INJECTION

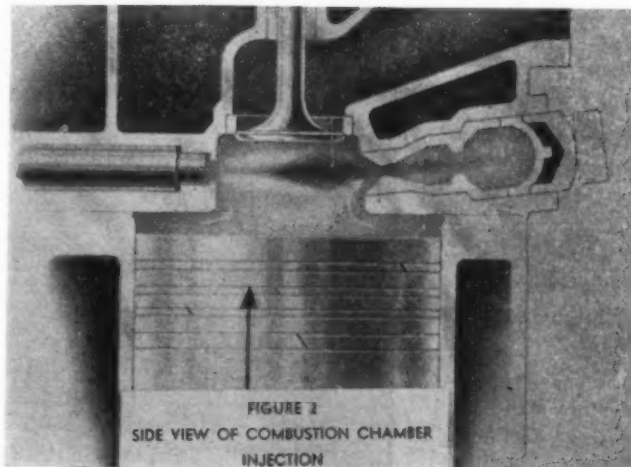


FIGURE 2
SIDE VIEW OF COMBUSTION CHAMBER
INJECTION



FIGURE 3
SIDE VIEW OF COMBUSTION CHAMBER
POWER STROKE

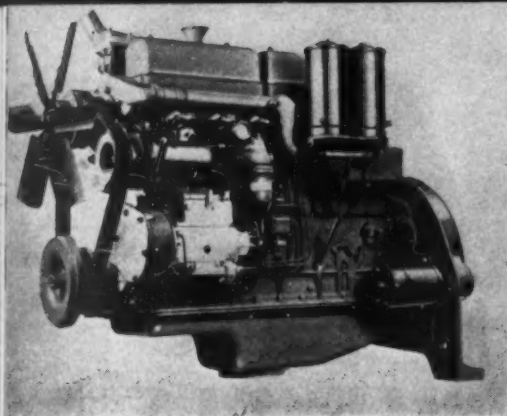
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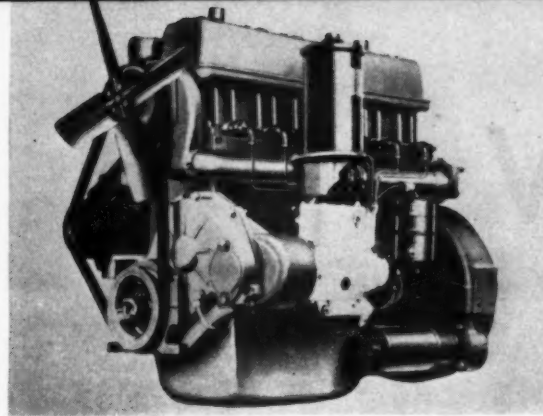
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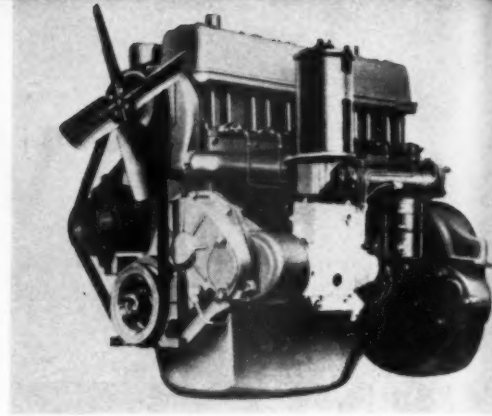
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Model RD-576 Industrial type Diesel, 6-cylinder, $4\frac{3}{4} \times 5\frac{3}{8}$, 572 cu. in.



Model TD-6427 Transportation type Diesel, 6-cylinder, $4\frac{5}{16} \times 4\frac{7}{8}$, 427 cu. in.



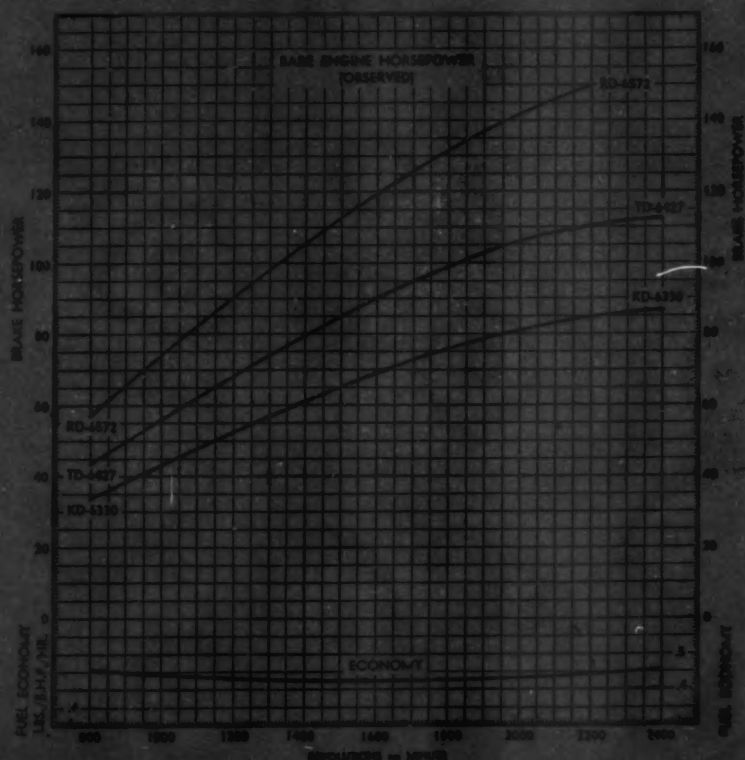
Model KD-6330 Transportation type Diesel, 6-cylinder, $4 \times 4\frac{3}{8}$, 330 cu. in.

sequently the actual combustion pressure, supplemented by the pressure trapped in the "Dyna-cell" acts at an effective crank angle. Red Seal Diesels thus operate smoothly and quietly as they are not subjected to destructive forces. Yet nothing is sacrificed in performance, because they register no loss in power or economy.

Continental prides itself on a long-established policy of supplying an engine virtually tailored to the user's needs. In fact the standard policy is to give the same attention to the individual requirements of the purchaser of one engine as to those of a 5000 unit buyer. Many of the high production parts common in Continental's full line of engines are used in its Diesels. With practically no installation change whatsoever, Continental's customers can offer their buses, trucks, tractors and industrial equipment to the trade with Diesels as well as with fuel oil, gasoline, butane and natural gas. This interchangeability of power plants is a distinct advantage and will greatly increase the sales appeal of the end product not only in the United States but throughout the world.

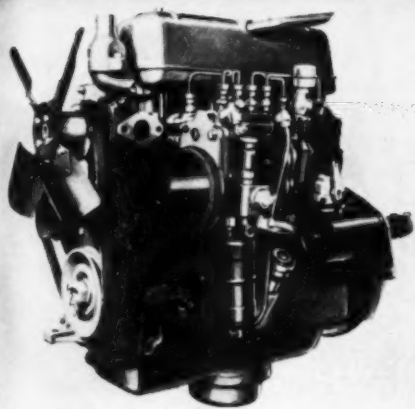
In further pursuit of this policy here are a few equipment alternates which Continental offers: Either American Bosch or Ex-Cell-O fuel injection equipment; aluminum alloy or tin-plated cast iron pistons; provision for heating fuel either electrically or by Flame Heater for cold starting; flywheel machined to take various standard clutches; 12 volt, 40 or 55 ampere generator, also either 12 or 24 volt starting motor; front mountings are all trunion type while rear mountings may be arm or pad type to suit installation requirements.

And so Continental launches its well rounded line of "Red Seal" Diesels, designedly sized and powered to fit the markets which promise greater and greater volume—a line of Diesels backed by more than forty years of engine-building experience.

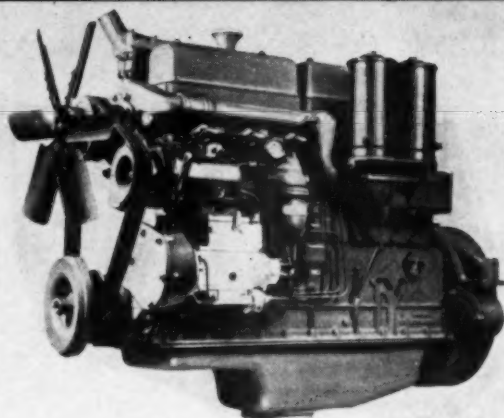


DIESEL TRANSPORTATION ENGINE DETAILS

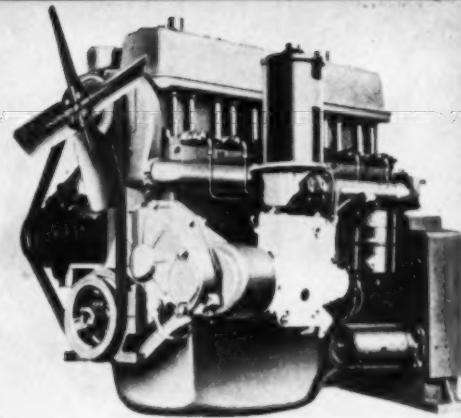
OVERHEAD MODELS	KD-6330	TD-6427	RD-576
NUMBER of Cylinders	6	6	6
Bore and Stroke	$4 \times 4\frac{3}{8}$	$4\frac{5}{16} \times 4\frac{7}{8}$	$4\frac{3}{4} \times 5\frac{3}{8}$
DISPLACEMENT in Cu. In.	330	427	572
A. S. rated Horse Power	38.4	44.6	50.0
P. M. at 1800 R.P.M. — Max. H.P.	38.4	44.6	50.0
P. M. at 1800 R.P.M. — Max. Torque	1371	1231	1100
OVERHEAD R.P.M. — maximum	2400	2400	2400
MAX. ENGINE H.P. at Max. Gov'd R.P.M.	55.0	64.0	72.0
MAX. ENGINE TORQUE — Max. in Lbs. Ft.	221.5	204.0	180.0
MAX. ENGINE H.P. at Max. Gov'd R.P.M.	106	106	106
P. M. for Max. Torque and H.P.	1250	1250	1250
AT H.P. at Max. Gov'd R.P.M.	70.0	70.0	70.0
AT TORQUE — Max. in Lbs. Ft.	15.1	15.1	15.1
OVERHEAD R.P.M. (Approx.)	15.1	15.1	15.1
NUMBER of Main Bearings	7	7	7
in Bearing DIAMETER	7	7	7
in Bearing LENGTH — Front	14	14	14
in Bearing LENGTH — Intermediate	Four 14	Four 14	Four 14
in Bearing LENGTH — Center	24	24	24
in Bearing LENGTH — Rear	24	24	24
in Bearing LENGTH (to center)	24	24	24
in Bearing LENGTH DIA.	24	24	24
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in — INTAKE — DIA. — HEAD	1 1/2	1 1/2	1 1/2
in — INTAKE — DIA. — THROAT	1 1/2	1 1/2	1 1/2
in — INTAKE — DIA. — ANGLE	45	45	45
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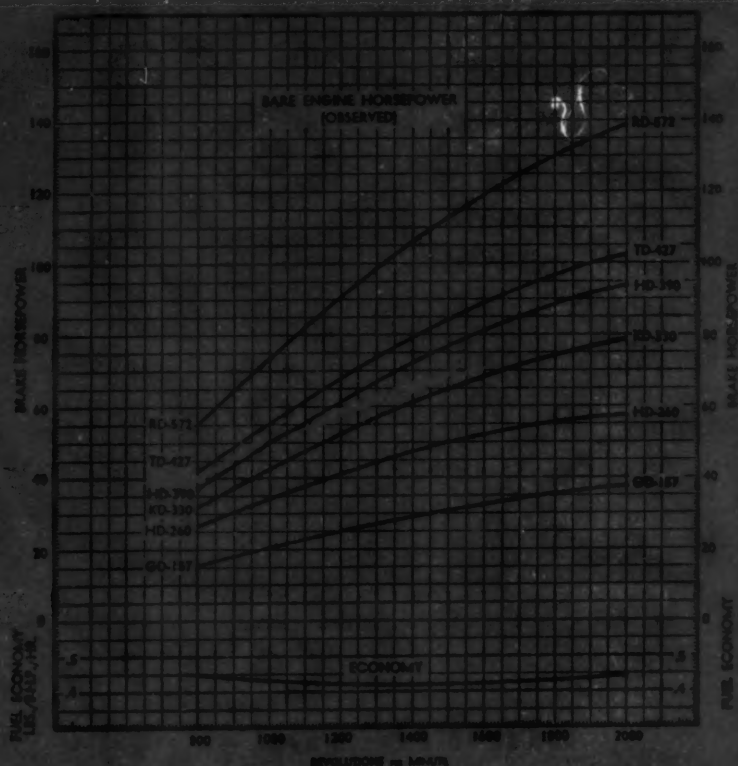
Model GD-157 Industrial type Diesel,
4-cylinder, $3\frac{3}{8} \times 4\frac{3}{8}$, 157 cu. in.



Model RD-6572 Transportation type
Diesel, 6-cylinder, $4\frac{3}{4} \times 5\frac{3}{8}$, 572 cu. in.



Model TD-427 Industrial type Diesel,
6-cylinder, $4\frac{5}{16} \times 4\frac{7}{8}$, 427 cu. in.

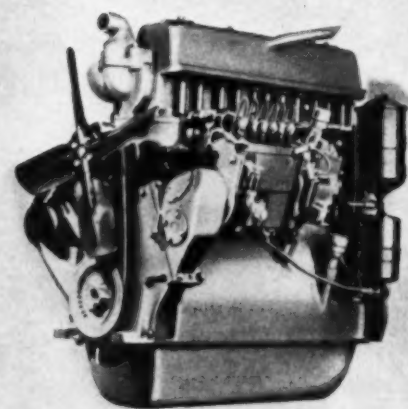


Model HD-390, although fully designed and tested, will be withheld from production until 1942

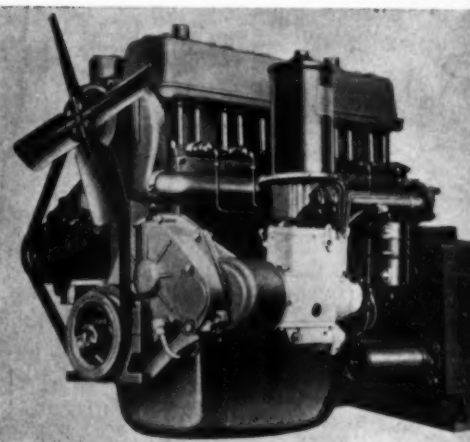
DIESEL INDUSTRIAL ENGINE DETAILS

OVERHEAD MODELS	GD-157	RD-300	KD-330	HD-260	TD-427	RD-6572
NO. of cylinders	4	4	6	6	6	6
DISPLACEMENT in Cu. In.	$3\frac{3}{8} \times 4\frac{3}{8}$	$3\frac{3}{8} \times 5\frac{1}{8}$	$4 \times 4\frac{3}{8}$	$3\frac{1}{4} \times 5\frac{1}{8}$	$4\frac{5}{16} \times 4\frac{7}{8}$	$4\frac{3}{4} \times 5\frac{3}{8}$
Rated Horse Power	15.3	24.0	38.4	36.0	44.5	54.2
H.P. at 1800 R.P.M. at 1800 F.P.B.M.	31.5	28.4	43.2	42.8	52.6	63.6
H.P. at 1000 Ft. Piston Speed Min.	1317	1090	1371	1090	1231	1116
TURNED R.P.M. — maximum	2000	1800	2000	2000	2000	2000
ENGINE H.P. at Governed R.P.M.	37.3	53.2	79.0	83.6	102.5	127.0
ENGINE TORQUE — Max. in Lbs. Ft.	109.0	141.0	229.5	272.0	299.0	400.0
ENGINE B.M.E.P. — Max. in P.S.I.	105.0	105.0	105.0	105.0	105.0	105.0
I.M. of max. Torque and B.M.E.P.	1250	1100	1200	1250	1300	1200
H.P. at Gov. R.P.M. — INTER. DUTY	32.8	47.8	67.0	80.3	97.8	116.0
H.P. at Gov. R.P.M. — CONT. DUTY	28.0	41.5	59.0	70.0	77.0	103.0
COMPRESSION RATIO (Approx.)	15.1	15.1	15.1	15.1	15.1	15.1
NO. of Main Bearings	3	3	7	4	7	7
Crank Bearing DIAMETER	2 1/2	2 1/2	2 1/2	2 1/2	2 1/2	3 1/4
Crank Length — Front	10 1/2	10 1/2	11 1/2	10 1/2	10 1/2	13 1/2
Crank Length — Intermed.			Four 1 1/4	Two 3/4	Four 1 1/4	Four 1 1/4
Crank Length — Conn.	1 1/4	2 1/4	2 1/4	2 1/4	2 1/4	2 1/4
Crank Length — Rear	1 1/4	1 1/4	2 1/4	1 1/4	2 1/4	2 1/4
Connecting Rod Length (6 to 6)	7	9 1/2	9 1/2	9 1/2	8 1/2	10 1/2
Connecting Rod Length — DIA.	2 1/2	2 1/4	2 1/4	2 1/4	2 1/4	2
Connecting Rod Bearing LENGTH	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
INTAKE — Dia. — HEAD	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
INTAKE — Dia. — THROAT	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
INTAKE — Seat — ANGLE	45°	45°	45°	45°	45°	45°
EXHAUST — Dia. — HEAD	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
EXHAUST — Dia. — THROAT	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
EXHAUST — Seat — ANGLE	45°	45°	45°	45°	45°	45°
CRANK SHAFT — I. D.	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	2 1/4
CRANK SHAFT — I. D.	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	2 1/4

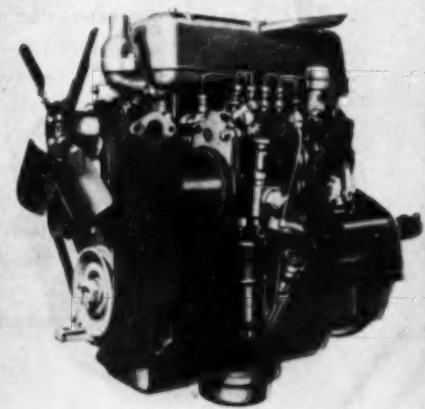
Note: Some Bearings are OBSERVED and are not corrected



Model HD-390 Industrial type Diesel,
6-cylinder, $3\frac{7}{8} \times 5\frac{1}{2}$, 390 cu. in.



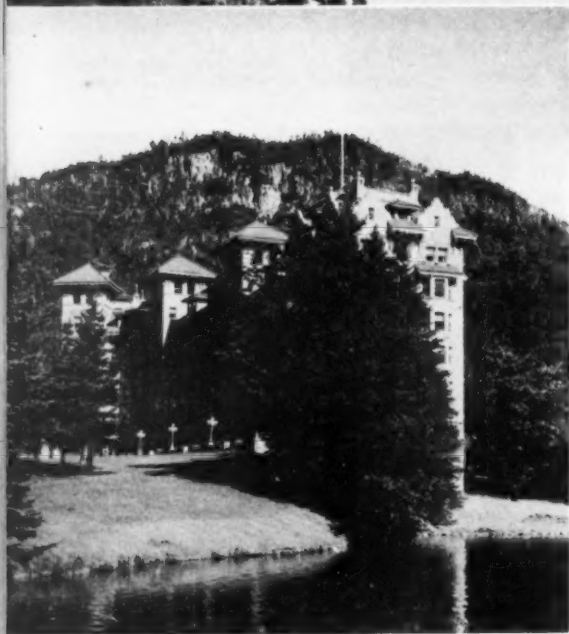
Model KD-330 Industrial type Diesel,
6-cylinder, $4 \times 4\frac{3}{8}$, 330 cu. in.



Model HD-260, Industrial type Diesel,
4-cylinder, $3\frac{7}{8} \times 5\frac{1}{2}$, 260 cu. in.



The "Balsams" at Dixville Notch, New Hampshire, nestles in a setting suggestive of Switzerland.



JUST a few miles below that northwestern tip of New Hampshire that juts into Canada is a section known as "The Switzerland of America." Surrounded by the towering beauty of the White Mountains with lakes and forest of untouched naturalness is the centerpiece of this table of scenic wonder-land so lavishly set by Nature—The Balsams Hotel at Dixville Notch, New Hampshire.

A completely self-contained and self-dependent

unit, solely devoted to the comfort and pleasure of approximately 450 guests, the Balsams has for over fifty years enjoyed a reputation for excellence of cuisine and facilities, unusual even among the European luxury hotels.

The present owner, Alvan E. Kallman of New York, is responsible for the great upsurge of popularity The Balsams has enjoyed in the three years under his aegis, improving, as he has done, the natural beauty of the location,

adding a modern theatre and cocktail lounge here; an expertly staffed solarium and beauty salon there, until the hotel now offers the ultimate in rest and recreation.

A favorite gathering place for people of Boston, Philadelphia and New York since the nostalgic neon-less days of 1893 when The Balsams first opened its doors, this Taj Mahal of hotels has become, in the past three years, a veritable mecca for distinguished summer sybarites, sun

DIESELS FOR NEW HAMPSHIRE'S BEAUTY SPOT

By JACK HOGAN

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Kallman
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worshippers and men and women of achievement.

It is here that the wealthy ex-patriates of shattered Europe find an excellent substitute for the casual gaiety of the Riviera, the frothy headiness of Lake Como or the sheer restfulness of Ostend.

This transition during the past three years was accomplished through the present owner's boundless capacity for knowing and entertaining people, his acquaintance with many of the great and near great in the worlds of achievement and society and, above all, his endless knowledge of the world and the hotel business.

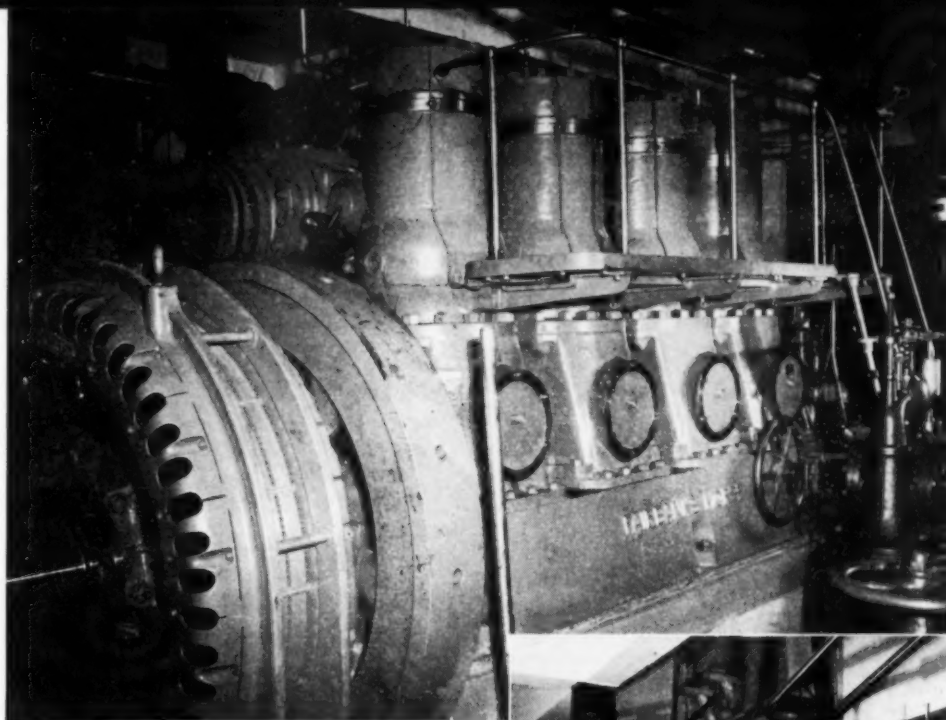
The Balsams' greatest drawing card is, of course, the magnificence of its setting, on the shores of Lake Gloriette, tucked into the quiet ruggedness of the White Mountains, like a pearl in a black velvet Tiffany window.

Providing every known variety of sport from checkers to golf, tennis, swimming and horseback riding, and entertainment that ranges from old-fashioned folksiness to Noel Coward settings, The Balsams is a completely self-sufficient community unto itself.

Situated as it is, eleven miles from the nearest village, The Balsams has always had to depend on its own telephone exchange, transportation system, laundry service and the thousand other facilities necessary for the welfare of this extensive estate.

Its complete isolation from the beaten path precluded the purchasing of electric power from the utility companies and for years The Balsams generated its own power by means of a hydro-electric turbine. Feeding the turbine's water-wheels was a high-level dam in the hills above the hotel and about a mile from it, but in recent years with the great increase in number of guests and service this was often precarious, robbing, as it sometimes did, the fire protection system of sufficient water for emergency.

Water was forced down by gravity through two parallel pent stocks to two water-wheels in the power house. The wheels, in turn, operated two generators of 80 and 120 kw. capacities which, in former years were ample for the needs of the hotel. However the advent of Mr. Kallman and his sheer genius caused the Balsams to bulge at the seams with guests, and severe droughts during his first two years of



Above and right: Two views of the F-M Diesel and generator which have shouldered the entire electrical load for the Balsams Hotel.

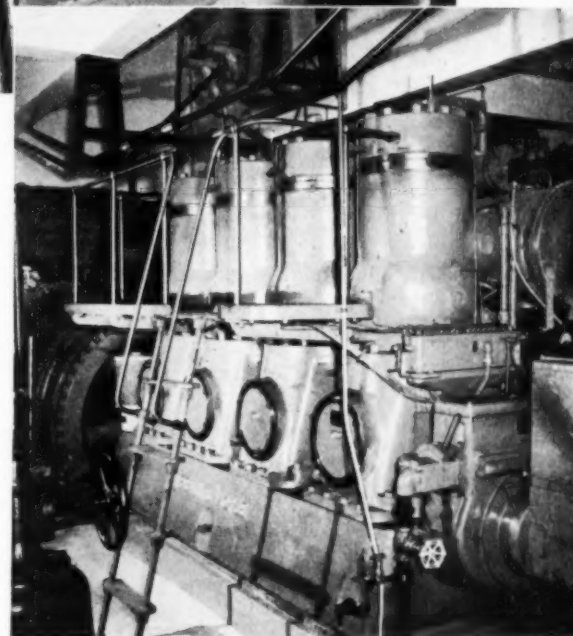
ownership brought the water in the dam to dangerously low levels at times.

It didn't take owner Kallman long to decide that Mother Nature was much too fickle to rely on and that he had better put his faith in a stout Diesel engine, man's greatest bulwark against the whims of weather. The need was for a Diesel engine generating unit capable of shouldering the entire power burden of what amounted to a community of about 850 people. For this a Fairbanks-Morse Diesel was selected.

He closed his hotel this season with a sigh of satisfaction. He can open it next June and greet his house full of guests, knowing that all he has to do is arrange for their entertainment and comfort while his Diesel keeps those vari-colored lights glowing brightly in The Balsams' sumptuous lounge and ballroom and responds instantly to the flick of a switch in a bed-room, the demand for ice in the kitchen or any of the myriad things that electricity makes possible.

With careful attention to minute detail, the company's erectors, mechanics and engineers proceeded, with a speed made imperative by the seasonal nature of the hotel's business, to take up where the factory artisans had left off.

Enlargements to the old power house were necessary to provide shelter for this new titan, foundation concrete had to be poured according to strict specifications and the massive but delicately tempered engine parts had to be set into place with gentle strength.



Finally the Diesel itself, a stationary, two-cycle, 300 hp. Fairbanks-Morse, four cylinder, 14 x 17, was in place and waiting for its teammate, the alternator, also a product of Fairbanks-Morse.

Once the alternator was in place, there remained only the completion of the wiring, setting up of the control panel and the last minute adjustments before the power plant was able to begin its existence.

Providing the needed direct current excitation for the alternator is a Fairbanks-Morse 7½ kw., 125 volt exciter with a speed of 1750 rpm., driven from the alternator shaft by a V-belt drive.

Burgess intake snubbers, an Asco, Automatic safety control system with automatic shutdown switch and an Illinois Testing Laboratory Pyrometer are part of the auxiliary equipment.

By CHARLES F. A. MANN

ORIGINALLY begun at Olympia, Wash., as the *Leviathan*, rated as the largest capacity tuna clipper hull built of steel, this giant vessel, rated only a few feet shorter than *Chicken of the Sea* but with slightly larger carrying capacity, now emerges as the *Sun Dial*, owned by a group of five men and operated in connection with the Sun Harbor Packing Co. of San Diego.

Sun Dial finally wound up in charge of John Brescovich, proprietor of Puget Sound Boat Building Co. and Pacific Boat Building Co., both of Tacoma, who completed the big welded steel vessel at the Puget Sound plant, and sold her to the California group.

The big tuna clipper is 131 x 31 x 17 ft. and improved hull lines, full aft, eliminates squatting when driven at full speed, loaded. She is powered with an 850 hp. Enterprise 8 cylinder, Elliott-Buchi turbocharged Diesel, with cylinders having 12 in. bore and 15 in. stroke. At 400 rpm. the Diesel pushed the fully loaded vessel on her trial trip at 11.7 miles.

Auxiliary power consists of three identical Atlas Diesels each developing 112 hp., and turning a 90 kw. Fairbanks Morse generator. All motors, generators, and pumps, aboard *Sun Dial* are Fairbanks Morse. Two of the auxiliary Diesels are in the lower engine room while one of them is on the machinery flat, where are likewise located four York ice machines, each powered by 40 hp. F-M motors.

All Diesel engines are provided with freshwater

cooling, the three Atlas engines having Alaskan Copper Works heat exchangers and the main Enterprise carries a Thermax exchanger. Alnor pyrometers are fitted on all the Diesels. Pilot house control of the main Diesel is provided, and there is an 18 ft. Western Fairliner speedboat mounted on the after end of the deck.

The vessel is compactly designed and carries a total of 14 cargo wells below and the two-compartment deck bait tank. By proper synchronization of the fuel load in four of the cargo wells, an extra 33,000 gallons of fuel oil storage may be carried on the outbound voyage, and six of the cargo wells below are equipped to carry live bait on the outward voyage, giving the vessel a total capacity of 1700 scoops of live bait. The 16 cargo wells are equipped to handle frozen cargo on the return voyage, filling either oil tank space or bait space in rotation, the last to be filled being the two deck bait tanks.

More than 17,000 feet of brine pipe is coiled in the 16 tanks, which accounts for the heavy capacity of the refrigeration machinery layout. Bunker space is provided for 32,000 gallons of fuel and 2400 gallons of lube oil, in addition to the outward voyage auxiliary fish tank capacity of 33,000 gallons.

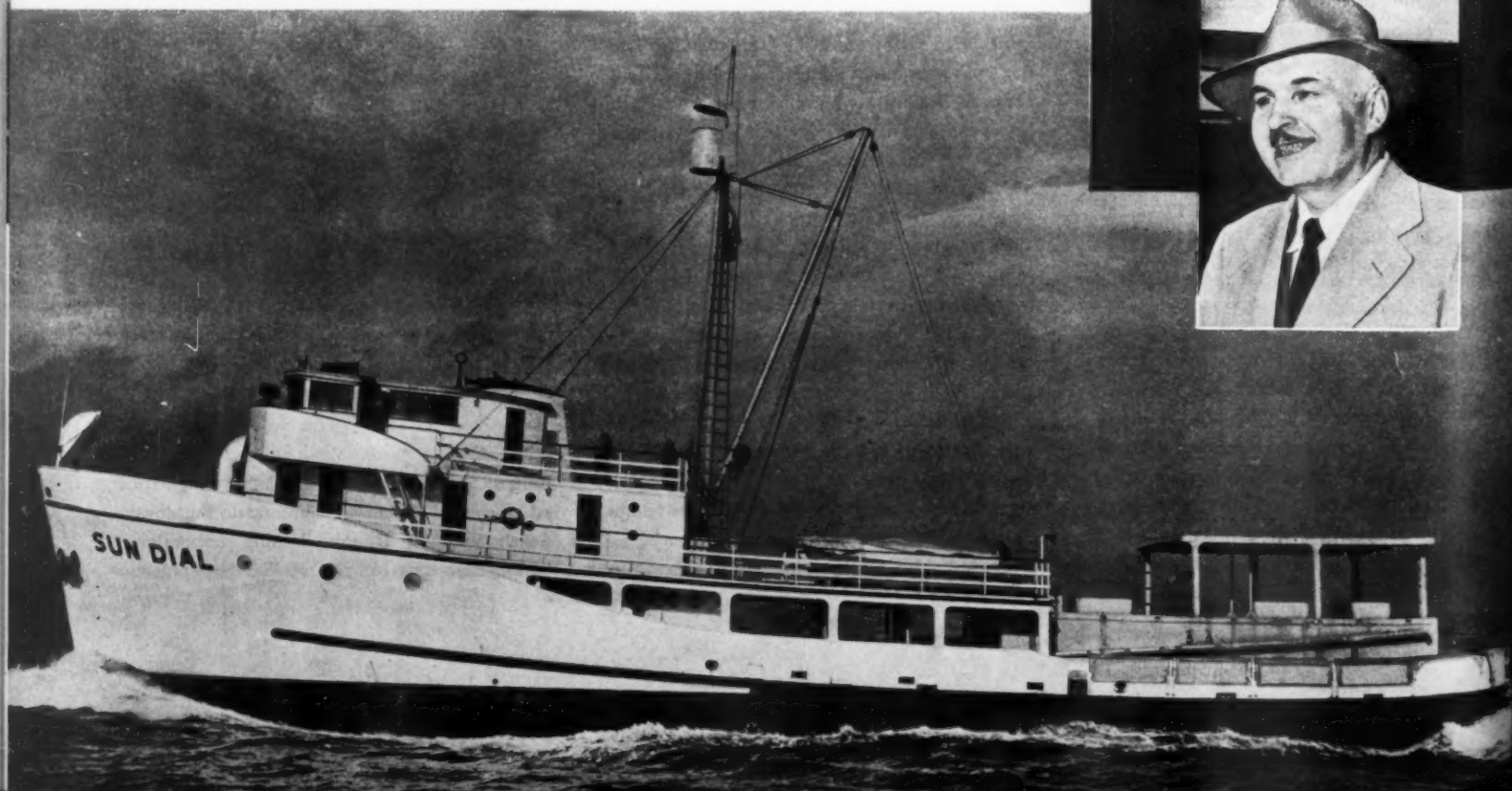

A complete Sperry Gyroscope Compass and Gyro Pilot provides four kinds of steering: Manual; Manual Electric; Full Automatic and Side-Station for maneuvering in close quarters. Repeater compasses are provided as well as auxiliary engine controls at the outside stations. Elaborate radio and Fathometer equipment is provided as well as a PA system throughout

the ship. The galley even has a dual ice-box—one for normal refrigeration and the other for frozen foods.

Ownership is in the hands of Fred Brown, head of the group of 5 owners, with Captain Paul Fernandes and Chief Engineer Tony Jelusich as the two who will operate the ship. *Sun Dial* is the second of the large, postwar super tuna fleet now abuilding up and down the Pacific Coast.

"LEVIATHAN"
Emerges as
"SUN DIAL"
DIESEL
TUNA
CLIPPER

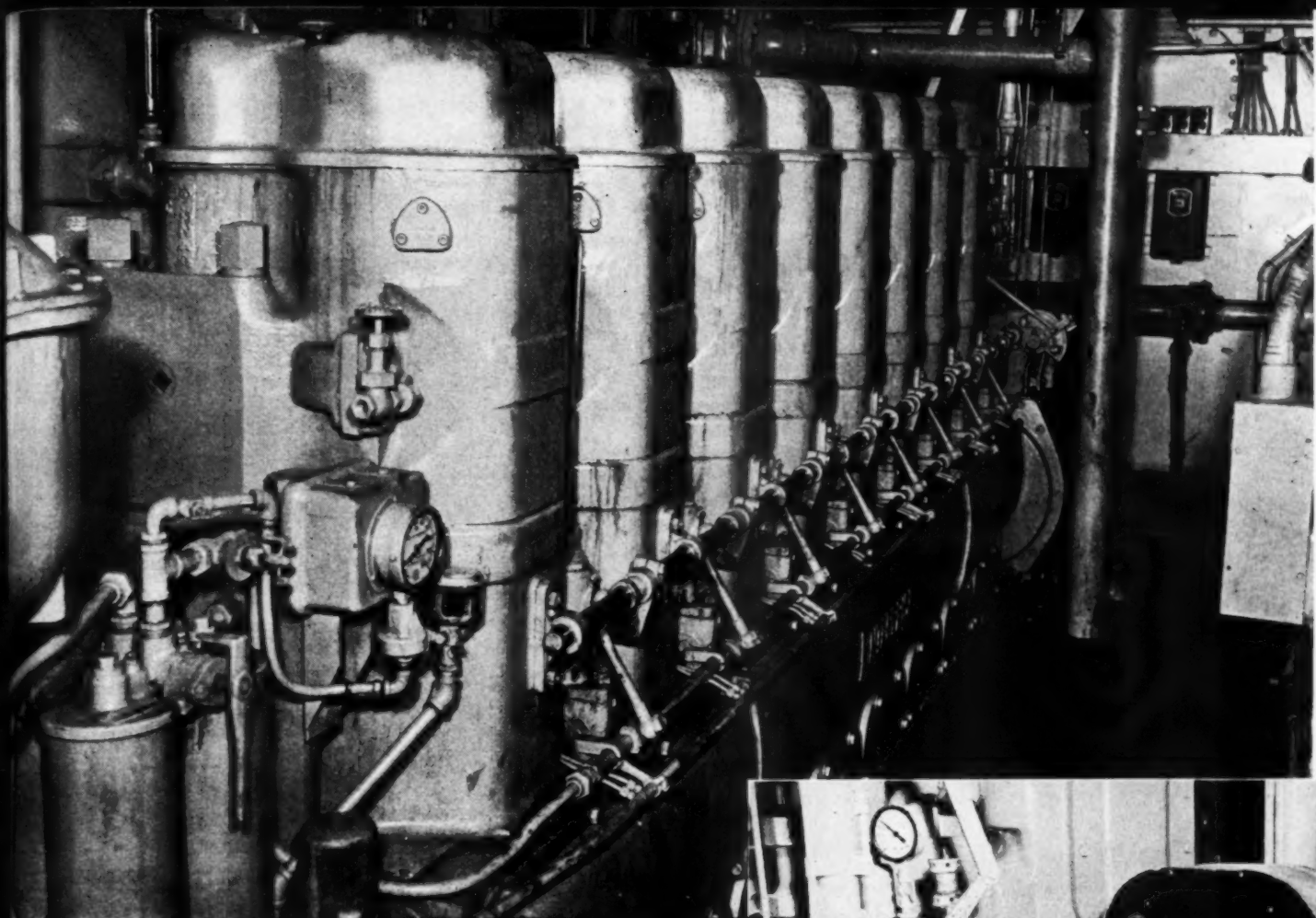
Fred Brown, managing owner of "Sun Dial"



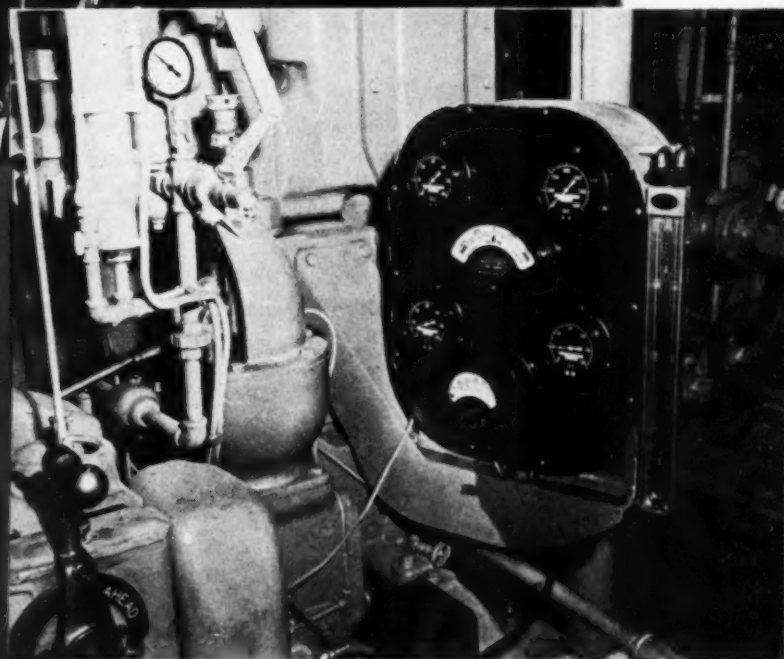
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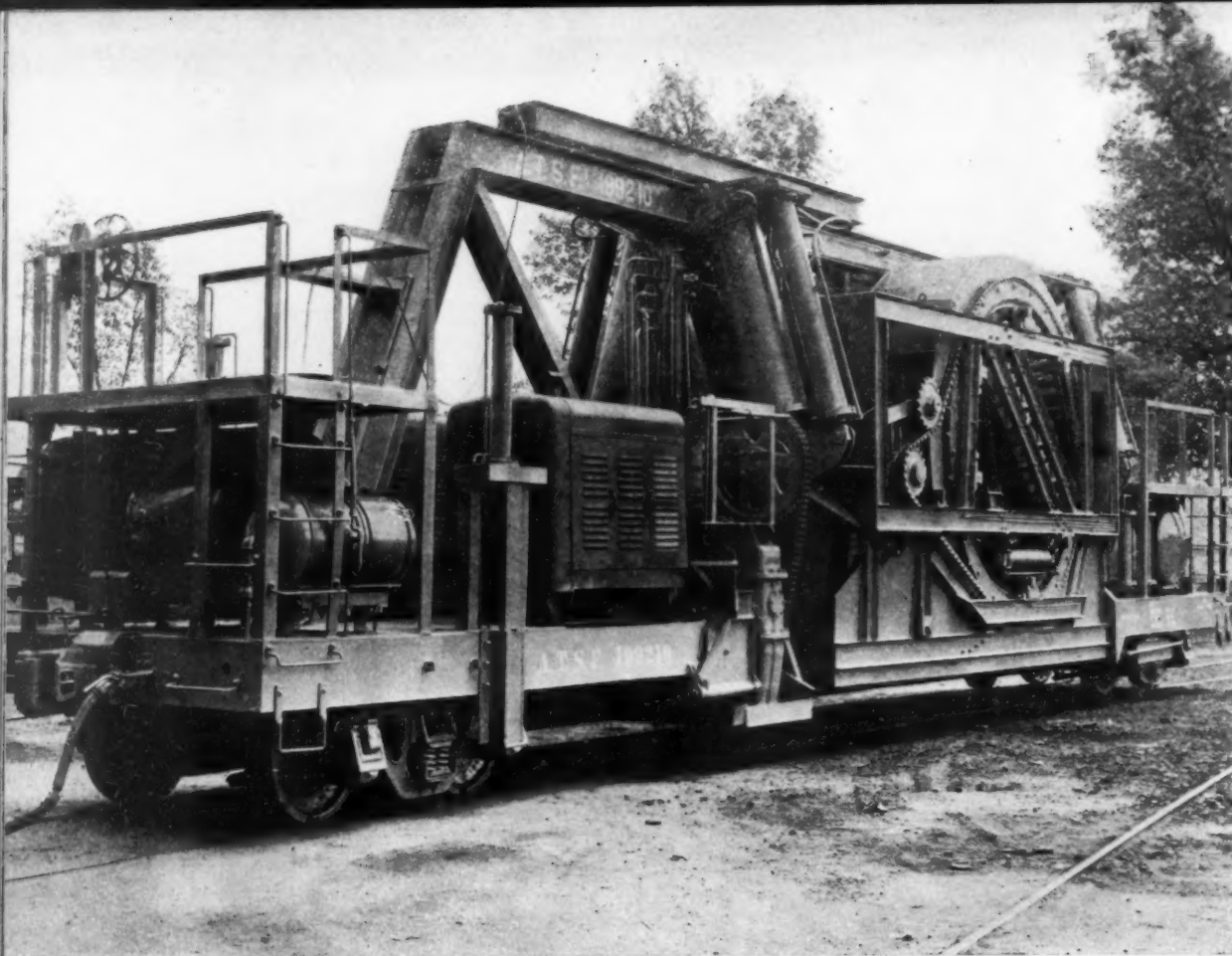


Engine room of "San Djal" showing Bayliner, 230 hp, Enterprise Diesel with Elliott-Buchi turbosupercharger installed.



View showing instrument panel of Enterprise Diesel with Alnor pyrometer and Weston rpm indicator.





Special railway car which is pulled over the right of way by a locomotive and is equipped to reballast the road bed, repair shoulders, weed the right of way and clear out drainage ditches. Each operation for which the car is designed is powered with a Buda-Lanova Diesel.

BUDA-LANOVA DIESELS for AUTOMOTIVE MARINE and INDUS

This Euclid 20-ton truck, powered with a 6-cylinder Buda-Lanova Diesel hauls ore out of the pit on the iron range near Coleraine, Minnesota.



A fishing vessel

*Typical long
Buda-Lanova engine
between Los*

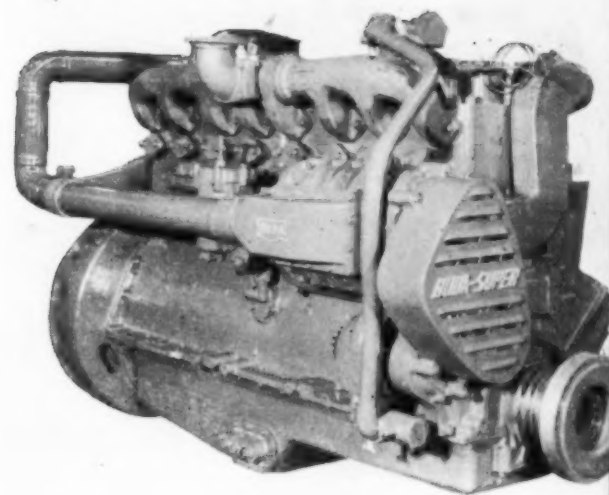




A fishing vessel, typical of hundreds which operate out of Seattle, Washington, powered with a 6-cylinder, 844 cu. in. Buda-Lanova Diesel.

and INDUSTRIAL POWER APPLICATIONS

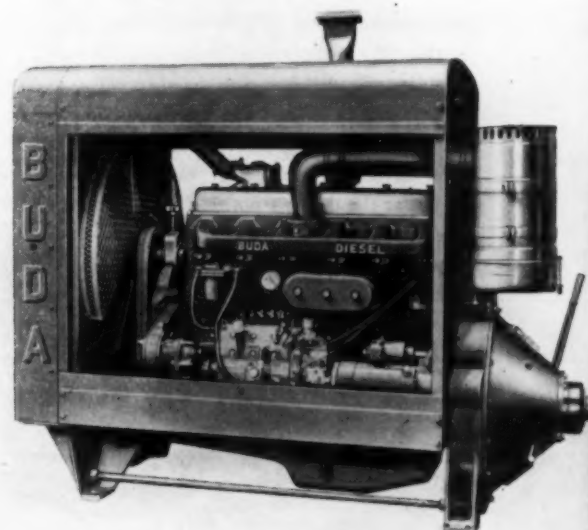
Typical long distance, over the highway freight outfit hauled by a 6-cylinder Buda-Lanova engined truck tractor unit with one trailer entrain. This equipment operates between Los Angeles, Salt Lake City and San Francisco.



A Buda-Lanova supercharged 8-cylinder, 1125 cu. in. automotive type Diesel, one of Buda's new "161" series.



Buda-Lanova 6DC844 automotive type Diesel. Rated 180 hp. at 1800 rpm.



An industrial power unit with a Buda-Lanova 6DC844 Diesel equipped with radiator, fan, clutch and all necessary operating accessories. A complete packaged power unit ready to operate anywhere.

THREE TWIN-DIESELS FOR NEW DRILL RIG

By DWIGHT ROBISON

ARRIVAL of the first complete Ideco mechanical rotary drilling rig for use in California was recently celebrated by Howard Supply Company of California with Fairbanks-Morse, Vernon Tool, Cardwell Mfg., Kittell Muffler Co., Cameron Iron Works, Clark Brothers, Patterson-Ballagh and S. K. Wellman Company collaborating with allied displays. Featured in the new Ideco rig were the three General Motors twin 71 Series Diesel prime movers.

These twin power units combine the power output of two six-cylinder Diesel engines on a single output shaft through interlocking reduction gears so that with the engines turning 1600 rpm., the output shaft speed is 900 rpm.

Under these conditions the power units are rated just under 300 hp. for intermittent service. Each Diesel is fitted with a Kittell air-cooled exhaust silencer.

Smooth and flexible operation are outstanding features of the Ideco M-10000 powerhoist. The secret lies in the use of air-friction type driving clutches throughout. These are Fawick Airflex clutches which employ a rubber tire-like gland which is expanded and contracted by controlled air pressure to engage the driving and driven members of the various power take-offs and drum drives. By means of simple air valves located at the driller's position each clutch may be engaged or disengaged at will—even torque transmittal can be regulated by controlling the amount of air admitted to or released from the gland. The Airflex clutch also actually dampens torsional vibration and absorbs shock thus relieving the operating elements of these stresses.

From the foregoing it will be seen that the Airflex clutch may be engaged and released gradually, that torque can be regulated to any desired degree in addition to which the resilient gland itself readily compensates for any reasonable misalignment of driving and driven elements. Furthermore there is no concentrated area of wear since traction is uniform over the entire friction surface.

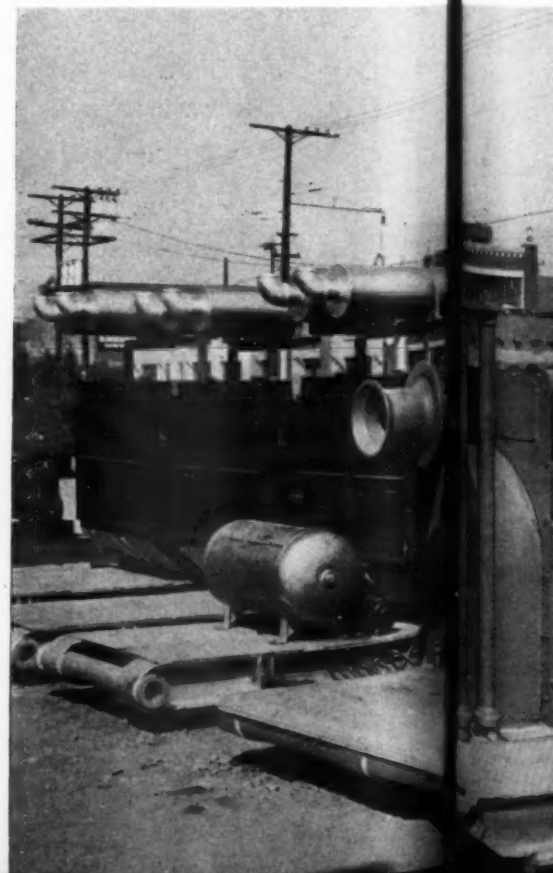
Another interesting feature of the Ideco rig is the use of multiple strand-chain drives designed with a generous factor of safety and operating in dust-proof oilbath housings for all transmission drives, drives to line shaft, primary rotary drive and secondary rotary drive. Compounding drives, hoisting unit drive and pump drive are multiple V-belt which, combined with the Airflex clutches further reduce torsional vibration. A Clark Brothers 7¼ x 12 in. Triplex Mud Pump was supplied with this new Ideco M-10000 rig.

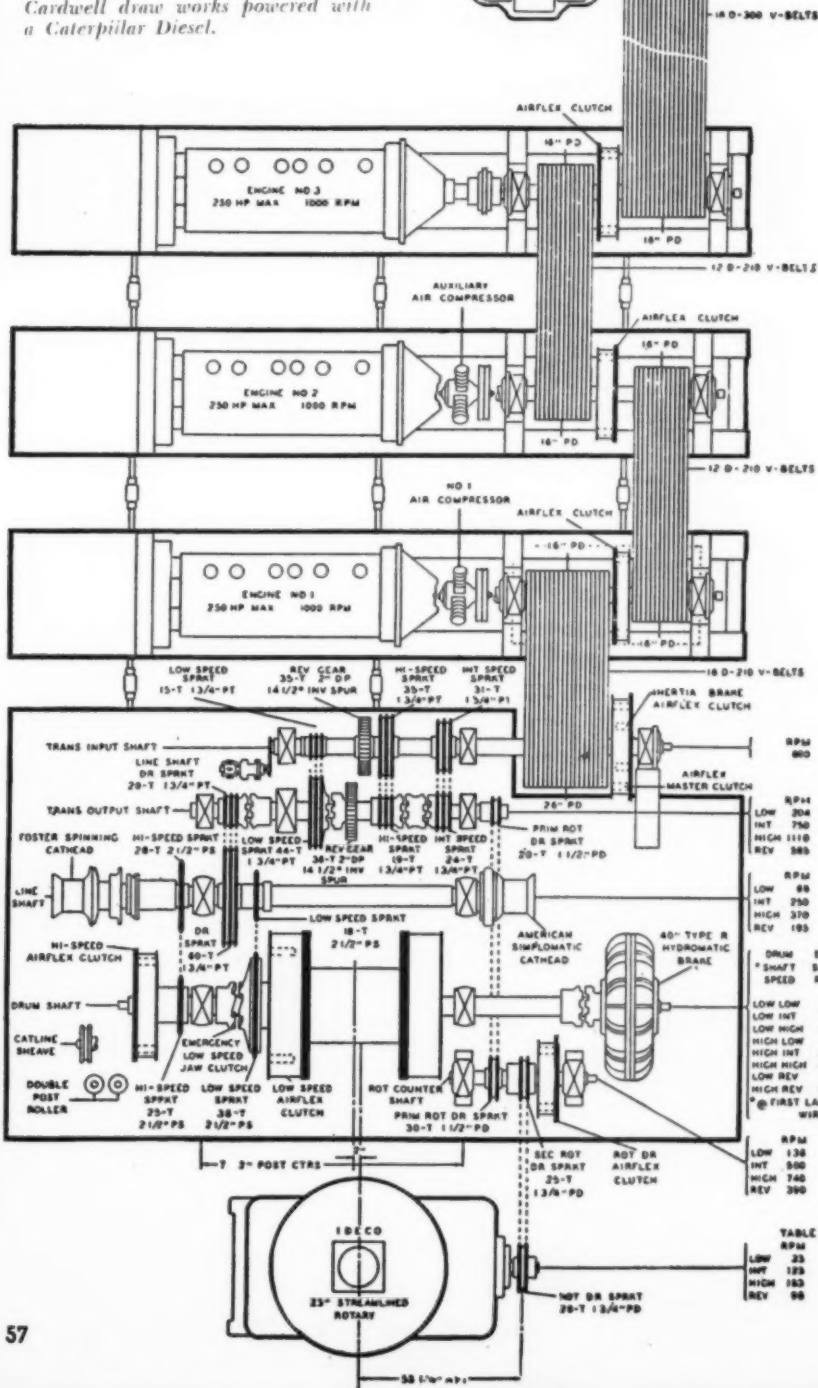
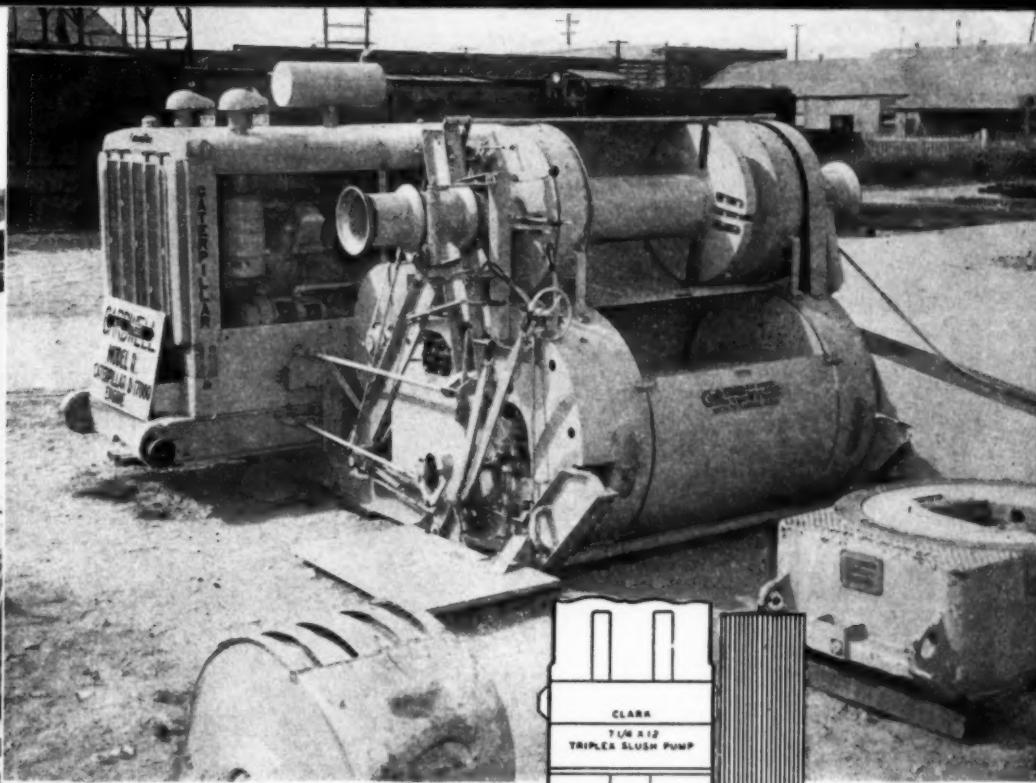
It is reported that one of these rigs, operated by Stephens Petroleum Company, set a record in the West Edmond Field by making 5500 feet in 26 days. Another, owned and operated by Jack Fazier of Houston, was set up on a difficult Bayou location north of Orange, Texas and drilled a 9514 ft. hole in forty-seven days. Oil field operators are learning, through increasingly satisfactory experience, of the advantages of Diesel prime power units in drilling operations. Economies accruing from the Diesel's high overall availability, low maintenance and its outstanding ability to get right down and lug and still stay on the job are too good to be overlooked. Diesels will be prominent in future oil field exploitation.



General view of the Ideco M-10000 drill power plant and transmission. The engines are three sets of "Twin" General Motors Diesels coupled through Fawick Airflex clutches.

Snapped in Buas, pro owner. T California.

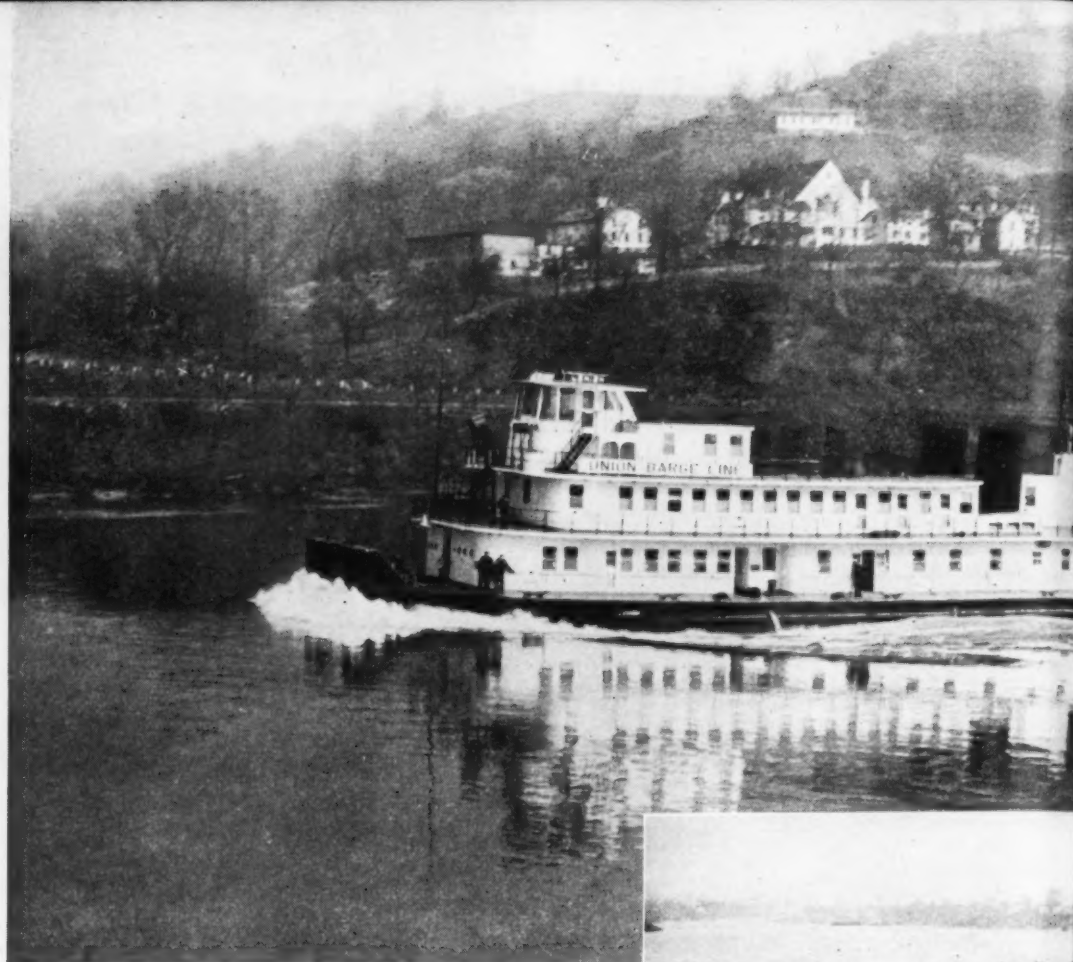




Snapped with the new Diesel drill rig is Walter Buas, president of Buas Drilling Company, owner. The rig is now operating at Elk Hills, California.



NEW DIESEL TOWBOAT "LEHIGH"



Union Barge Line's new towboat "Lehigh," powered by two turbocharged 8-cylinder 1,000 bhp. Superior Diesels.

EXTENSIVE river tests indicate an unusually high degree of efficiency and power for the newly built Union Barge Line Towboat *Lehigh*. This twin-screw, Diesel towboat, built by Dravo Corporation at its Pittsburgh Shipyards, has demonstrated "thrust" (pounds push) that ranks it with the foremost vessels on the rivers in the amount of fleet tonnage it can effectively handle.

Of all-welded steel construction, the *Lehigh* is 176 ft. x 36 ft. 5 in. x 10 ft. She is modern in every respect and offers accommodations for crew, officers and owners in a style as new and complete as present day engineering can provide.

The *Lehigh*, named for Lehigh University in Bethlehem, Pennsylvania, is the first of two new high powered vessels which Union Barge Line has ordered from Dravo Corporation. Together with her not yet completed sistership, the *Cornell*, she will be used in the Mississippi and Ohio River trade. These vessels are a continuation of a program of modernization which was interrupted by the war.

* Selected as one of the Distinctive Ships of 1940.

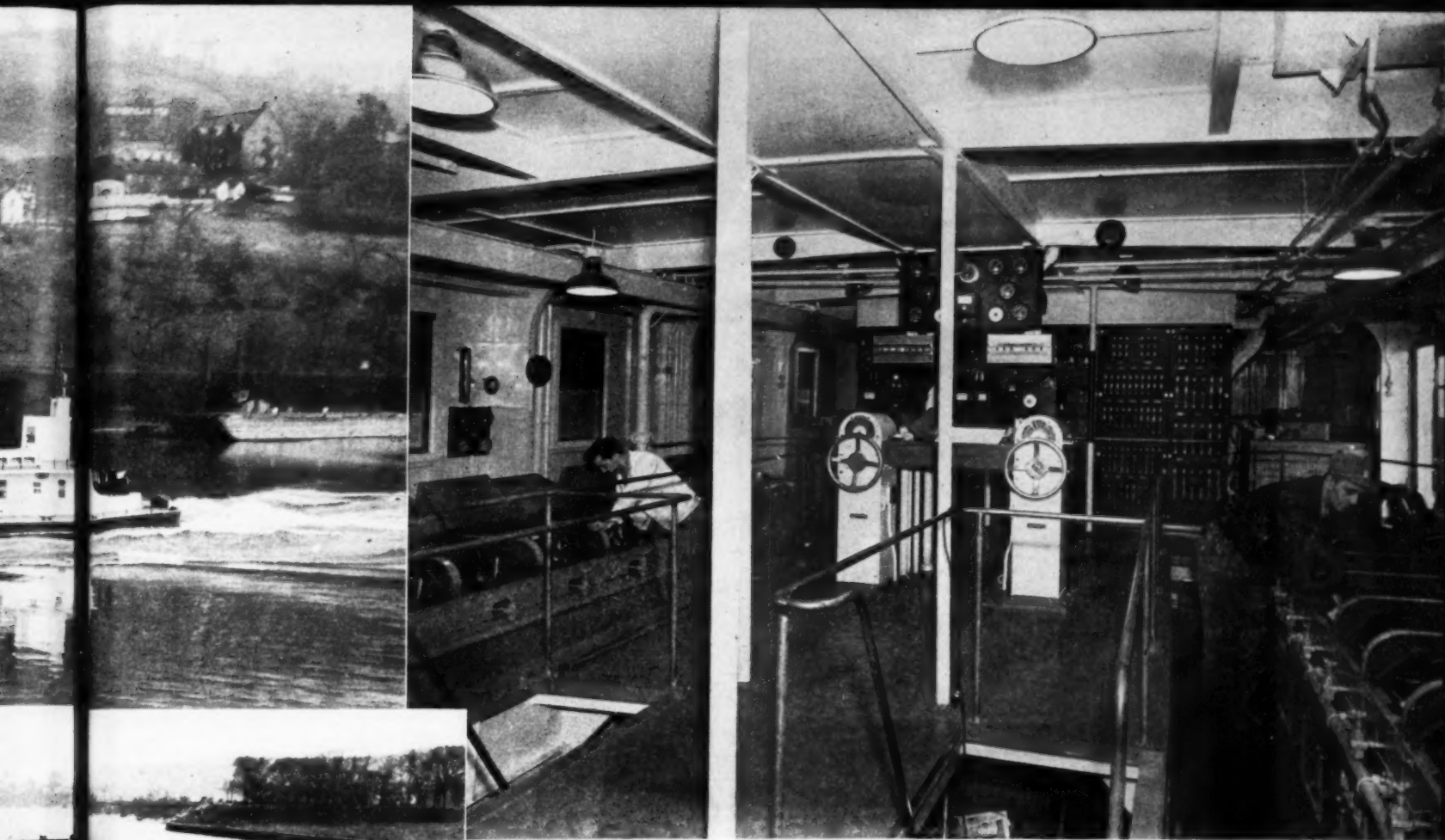
Because the design of the *Lehigh* was based on that of the *Wm. Penn*,* a direct comparison can be made of the pushing power of these two modern towboats; likewise can be made an interesting study of how to make the same boat do more work by the use of improved propulsion methods. When the *Wm. Penn* was built by Dravo Corporation in 1940, she was equipped with two main propulsion engines made by Superior Engine Division of National Supply Company. These engines are 8-cylinder reversible 4-cycle mechanical injection Diesels and have a 14½ in. bore and a 20 in. stroke giving a total of 1300 brake horsepower. The *Wm. Penn* had a pair of Kort Nozzles included in the hull structure. In actual performance it was found that the Kort Nozzles had increased the effective thrust to the point where the *Wm. Penn* could do the job of a sternwheel steam powered vessel of 2000 rated horsepower.

The new towboat *Lehigh* has basically the same hull size and design and the same engines as the *Wm. Penn*. In order to make greater utilization of this hull size, the designers decided on supercharging the engines. Extensive test results show a considerable gain in pushing power for the *Lehigh* over the *Wm. Penn* under varying towing conditions.



The tests upon which the accompanying curve is based were held in the Ohio River where ample loaded barges were available to vary test conditions. Readings were made from a dynamometer barge, inserted between the *Lehigh* and the flotilla formations that were used in the tests. The performance gain over that of the *Wm. Penn* as shown in the curve is due to supercharging of propelling engines

and the use noted that creased from of the propo Studying the recent river when it was lowing comp



(Above) Upper deck of main engine room showing control platform and switch gear. Top of Diesels seen left and right. (Left) "Lehigh" pushing 18 barge tow on Ohio during a test run. Tow is especially wide to increase resistance for testing purposes.

Speed in mph.	Thrust in Pounds		"Lehigh" % of increase
	"Wm. Penn"	"Lehigh"	
0	41,000	61,000	48.7%
5	31,800	52,800	66.0%
6	28,600	49,900	74.4%
7	25,000	45,900	83.6%

The improved performance of the *Lehigh* was obtained with no sacrifice in handling qualities. The *Lehigh* like the *Wm. Penn* is equipped with four backing and two steering rudders and maintains the extreme maneuverability that is a prime requisite of river work.

The hull and superstructure are of welded steel construction throughout, lined with joiner work and insulating materials in living quarters and lined with insulation on the bulkheads, deckhouse side, underside of deckhouse top, and the underside of main deck in way of accommodations in the machinery spaces. The propelling machinery is located in the amidships hold space with the generating sets located on the main deck in this space, the air compressors, heat exchangers, etc. in the forward machinery hold space, the refrigerating machinery, etc., in the after machinery hold space, the steering engines in the after hold space, gear

stowage and rope drying in the forward hold space and the forepeak is a tank compartment.

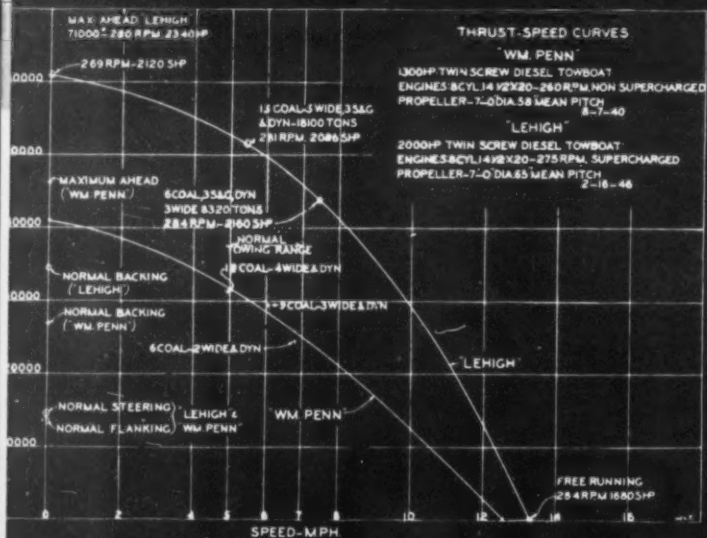
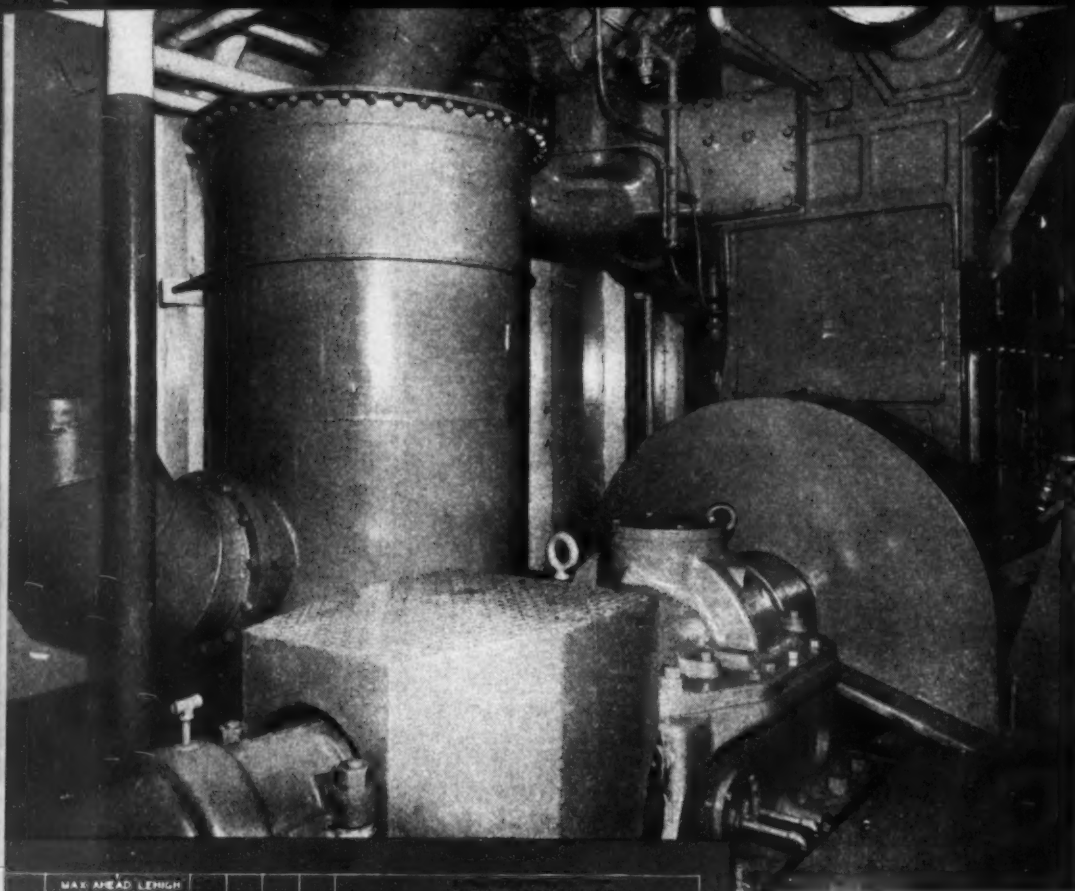
The hull forward is of ship model form fitted with two substantial towing knees built into and forming part of the bow. The hull aft is formed to house the propellers in especially designed tunnels; patented Kort Nozzles are fitted around the propellers and faired into the hull on the outboard sides. Two steering and four backing rudders are provided, which are operated separately by hydraulic, ram type steering engines controlled from pilot house.

The boat is provided with two stacks, one work boat, one derrick with power winch for handling work boat, four electric motor driven capstans, three searchlights and the usual complement of deck fittings.

The *Lehigh* is propelled by two eight-cylinder, reversible, four cycle, mechanical injection turbocharged Diesel engines. Each engine is direct connected to its propeller shafting and each drives a 7 ft. "high tensile" manganese bronze propeller. With a bore of 14½ in. x 20 in. stroke, each engine is rated at 1000 bhp. by their builder, Superior Engine Division of National Supply Company, at 275 rpm. Piping

and the use of oil cooled pistons. It might be noted that the operating rpm. has been increased from 260 to 275, although the diameter of the propeller remains the same.

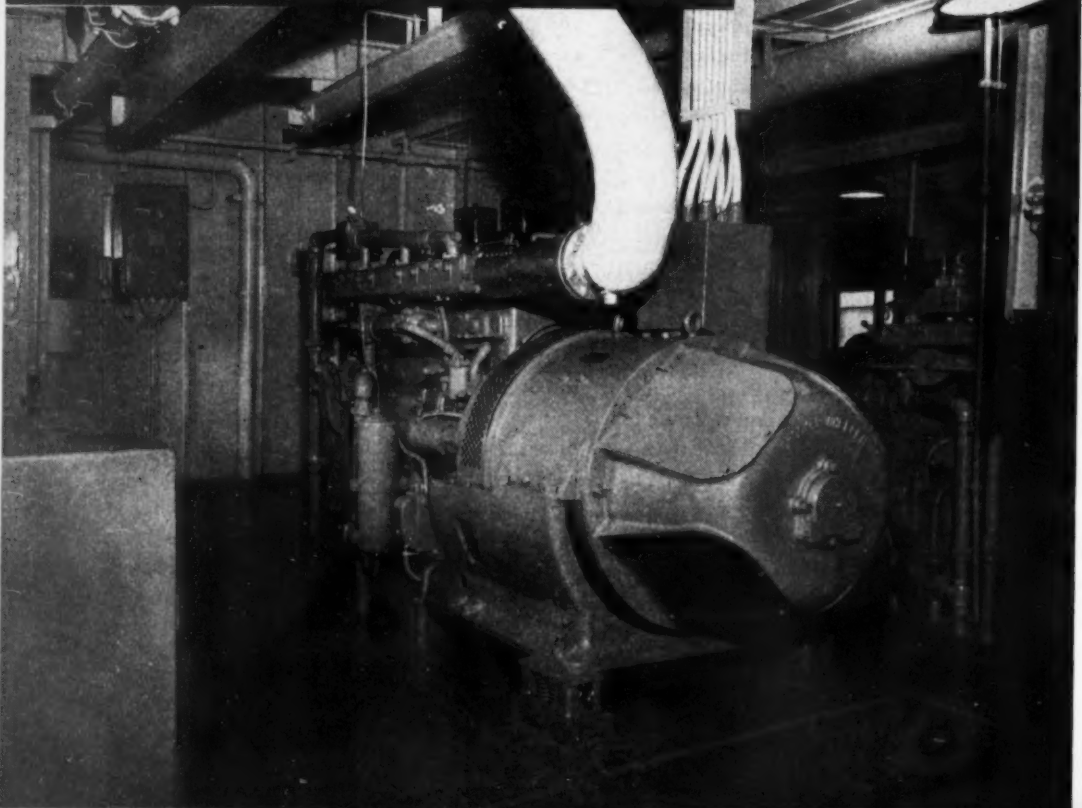
Studying the performance of the *Lehigh* in its recent river trials with that of the *Wm. Penn* when it was put into service in 1940, the following comparisons are obtained:



Lower deck view of engine room showing Kingsbury thrust bearing, Elliot turbo-charger and Cycoil air cleaner.

Comparative thrust-speed curves for "Lehigh" and sistership "Wm. Penn." The "Lehigh" is turbocharged.

One of three 60-kw. Superior Diesel driven Crocker Wheeler auxiliary generating sets.



system for starting air, circulating air, fuel and lubricating oil are built integral, each system ending in a single inlet or outlet connection.

A 21 ft. Kingsbury thrust bearing is mounted between each engine and propeller shaft. For reversing, the engines are equipped with a combination mechanical and pneumatic camshaft shift, and they have a built-in air distributor valve for starting. In addition to a remote control stand, the engines are arranged for operation from a stand located on the engine room upper grating.

The main engines are supercharged by the Elliott-Buchi system of turbocharging. Driven by gas exhausted from the power cylinders, the turbochargers greatly increase the efficiency of the engines. Fully automatic at all loads, no control is required. There is no mechanical connection on the chargers and they operate in positive rotation, whether the engine is driving forward or reversing.

Generator capacity is ample, electric current being supplied by three 60 kw. and one 20 kw. generators. The 60 kw. generators are of Crocker-Wheeler manufacture and are driven by 5 1/2 in. bore x 7 in. stroke Superior Diesel engines. These engines are six cylinder, four cycle and are governed for 1000 rpm. The generators are the two wire type, and are suitable for parallel operation with equalizer bus and can be adjusted to 125 volts. They are self-ventilated, have specially insulated winding and drip proof covers. The 20 kw. Crocker-Wheeler generator is driven by a 4 cylinder Superior Diesel. The generator and power distribution switchboard is a "live front" board of 1 1/2 in. ebony asbestos, supported on a free standing iron framework.

Fuel oil is carried in two wing tanks on either side, located in the after engine room. A De-Laval IMO pump, with 3 in. suction and 2 in. discharge, 50 gpm. capacity transfers fuel. A "Hilco" lubricating oil reclaimer, with 6000 watt heaters and a capacity of 12 gph. cleans the oil from each main engine sump tank. Two auxiliary air compressors, supplied by Gardner-Denver are installed. They are 6 1/2 in. and 2 3/4 in. x 5 1/2 in., two stage, vertical duplex water cooled high pressure type. Each is driven by a 30 hp. motor.

Steering ahead is effected by means of one rudder aft of each propeller and astern by means of two rudders forward of each propeller. Each system has its own steering gear. The rudders are of the balanced type and streamlined.

B y

A MI locomotive of the O. & N. Elk Mountain is a vital requirement found it necessary to meet the new mine's daily capacity.

The mine's North Fork is a tude of 6, preparation mately 2,0 the mine across the house. T increased switching



Tailor-Made Diesel MINE LOCOMOTIVE

By HARRY WALKER

A MIDGET Whitcomb Diesel-mechanical locomotive, tailor-made for the special needs of the Oliver Coal Company in the high West Elk Mountains of Colorado near Paonia, is doing a vital job in a peculiar set of hauling requirements. The coal company recently found it necessary to expand facilities in order to meet demands of customers. Accordingly a new mine was opened, doubling the company's daily capacity.

The mine is located on the south side of the North Fork of the Gunnison River at an altitude of 6,100 feet, with the dump house and preparation plant on the north side approximately 2,000 feet away. Coal is brought from the mine by electric locomotives and switched across the river, up a 3% grade to the dump house. The original tippie could handle the increased tonnage, but there was concern about switching the coal cars from the new mine to

the tippie. Battery locomotives could be used inside the mine, but were unsuitable for the outside haul.

Whitcomb engineers designed a special locomotive to suit conditions. It is a Diesel mechanical unit weighing 14,000 pounds in working order. The normal tractive effort rating, based on 25% adhesion is 3,500 pounds and the power unit is a Hercules Diesel engine rated at 56 hp. at 1,600 rpm. The constant mesh transmission is easy to shift and provides five speeds in either forward or reverse. Heavy-duty chains transmit the power to the axles.

Overall height of the locomotive was restricted to six feet because of obstructions along the tracks. To keep within this limit with a cab of conventional design would have meant insufficient room for the operator. This problem was overcome by increasing the overall length of the locomotive and placing the operator's seat on the rear bumper, thus providing plenty of leg and head room for a man of average stature.

Due to the high-altitude operation, special fea-

tures were provided to counteract the rarefied atmosphere and low temperatures. Additional radiator capacity was installed to compensate for the lower boiling point of water. Radiator shutters, operated from the cab, help to control the temperature of the engine water circulating system. A hot water cab heater was installed for the comfort of the operator.

The Whitcomb is handling 8-car trains, each car weighing 3,000 pounds and carrying 6,000 pounds of coal. The locomotive pushes these trains up the three-per cent grade into the dump house and handles 45 cars per hour over the 2,000-foot one-way haul.

Discussing the operation of the new engine, R. C. Oliver, general superintendent, states: "We find the unit is satisfactory in every respect, very economical on fuel and capable of handling heavy loads with ease. We find we are operating the locomotive for a fuel cost of about 37 cents per eight hour day." Oliver also revealed the company is investigating the possibility of using Diesel locomotives for underground haulage.



THE ALL-PURPOSE ROAD DIESEL

IS NOW A REALITY

By CHARLES F. A. MANN

CONSIDERABLE enthusiasm and vast quantities of conversation have hovered over all U. S. railroads operating Diesel road locomotives, since 1941, when the first General Motors 4-unit, 5400 hp. Diesel freight locomotive began operation on the Santa Fe, viz: "Why can't it also haul passenger trains"? That question has been going the rounds ever since that day.

With exception of two 2700 wartime General Motors freight Diesels, specially converted to a special round trip freight and passenger duo-operation between St. Paul and Duluth Superior, on the Great Northern, practically nobody has tried to mix up its fleet of Diesel freighters on a regular passenger business until last Fall, when the Denver and Rio Grande Western Railroad started using some of its fleet of twelve 5400 hp. freight Diesels to haul a regularly scheduled passenger train.

Last Fall a new, fast, overnight 8-car speedster, "The Prospector" named from an earlier small Diesel experimental train, began running night-

ly, both ways, between Salt Lake and Denver, each hauled by a two-unit, 2700 hp. Diesel, which is simply a big 5400 hp. 4-unit cut in half, with a single operating cab and a vapor car heating boiler in the rear of No. 2 unit.

With 75-80 mph. speed limit ample for this rugged Rocky Mountain territory, and a gear ratio of 61-16 or 62-15, and the regular 40 inch wheels, the trip is run off on precise schedule, with ample power to maintain easy operation on trains up to 650 tons for 8 standard steel cars, including the 50 mile gruelling 2.2% grade on the Moffat Tunnel line back of Denver. On the 176 mile stretch from Grand Junction, Colorado, to Helper, Utah, No. 7, the Westbound train, averages 47.1 mph. as against 37.2 mph. for the Exposition Flyer and 33.1 mph. for the Scenic Limited, both nationally famous "Name" trains. Very frequently the Exposition Flyer, with 18 heavy cars, is pulled all the way by a 4-unit 5400 freight Diesel, on perfect schedule.

The tight "Prospector" schedule with steam

and likewise the "Exposition Flyer" eats up 15 minutes at four different points on the 576 mile Denver-Salt Lake run via the Moffat Tunnel, for coal and water. The Dieselized "Prospector" is scheduled for only 10 minutes each at 3 points, and generally arrives ahead of time at these points. If delayed by those sudden Rocky Mountain storms, it can, after a brief 3 or 4 minute pause for water for the heating boiler, pull out right on the nose. With steam, this "Prospector" schedule requires assignment of 3 engines; with Diesel, but 2, due to high availability and ease of maintenance during the long daytime layover at each terminal.

Plans are already "jelled" for complete daily Diesel operation of the new, 1946 "Postwar" streamlined Exposition Flyer, a train of stainless steel coaches and sleepers, and "Astra Dome" cars, that will operate on a 44 hour Chicago-San Francisco schedule daily in each direction over the Burlington-Rio Grande-Western Pacific route. And the Rio Grande won't have to spend one dime additional on new motive power for its vital portion of this important fast train.

Three more 5400's are soon to join the fleet of 12 Rio Grande Diesel freight-passenger locomotives. These 15 Diesels, with their average of 22½ hours daily availability (the Rio Grande is proud to admit the third man in the cab—the Diesel maintainer, really pays real dividends in high availability), are ample to

Above: Two "Prospector" up Anniversary

completely Moffat Tun

The Rio G have taken we are leavi not only inc now averagin dividends in failure on a known to da

The compan off from its 5400's to the automatically Tennessee Pa hauling secti Glenwood Sp

So, when you Diesel," reme up every da passengers as is published, overlook the night freight tion of the C cost records co



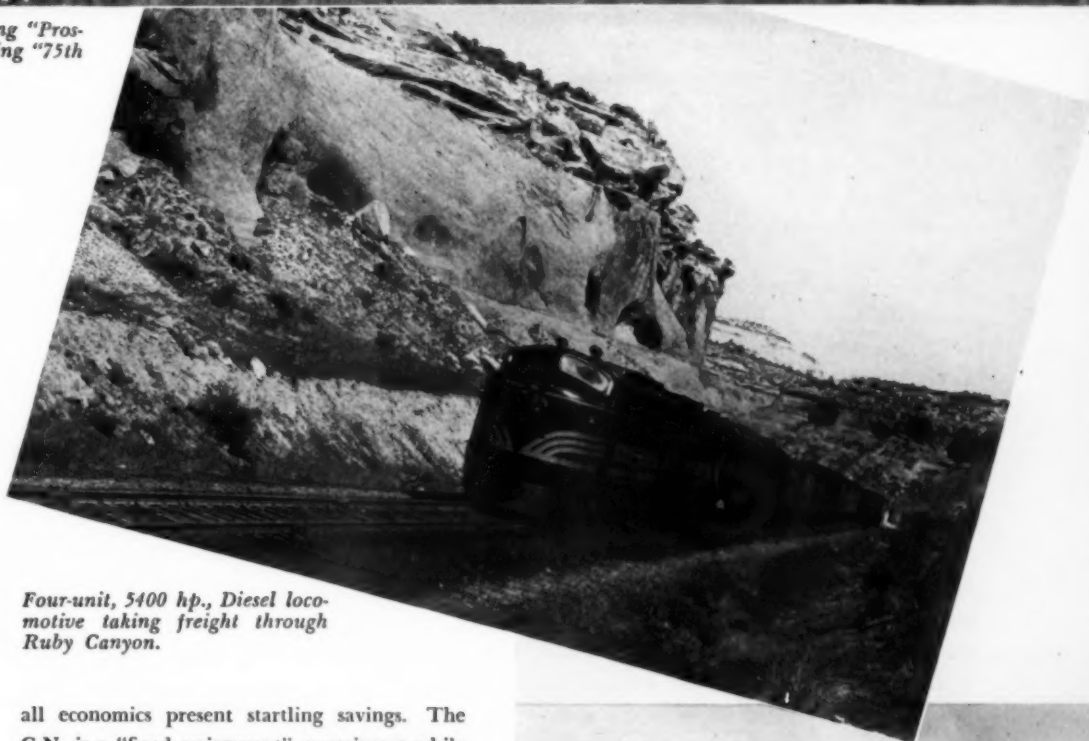
Above: Two-unit 2700 hp. Diesel freighter hauling "Prospector" up Rockies. Left: Four-unit engine hauling "75th Anniversary Special."

completely Dieselize the Salt Lake-Denver Moffat Tunnel route of the Rio Grande.

The Rio Grande says: "While some railroads have taken their maintainers off their 5400's, we are leaving them on ours indefinitely, as it not only increases availability of the engines, now averaging 22½ hours daily, but pays good dividends in preventative maintenance. A road failure on any of the 5400's is virtually unknown to date on the Rio Grande."

The company proposes, as freight traffic falls off from its wartime peak, to assign regular 5400's to the heavy passenger service, and thus automatically relegate steam operation to the Tennessee Pass line and to the middle, or coal-hauling section of the joint route West of Glenwood Springs.

So, when you read of 1946's "All Purpose Road Diesel," remember the Rio Grande "mixes" 'em up every day on freight, as 5400's, and on passengers as two 2700's and by the time this is published, may use 5400's too. And do not overlook the unique evening-passenger, mid-night freight 2700 hp. Diesel round trip operation of the Great Northern, where impressive cost records continue to pile up daily and over-



Four-unit, 5400 hp., Diesel locomotive taking freight through Ruby Canyon.

all economics present startling savings. The G.N. is a "fixed assignment" experiment while Rio Grande is a "freight-passenger pool" type of operation.

One more step in the One Speed-One Locomotive Type American Railroad trend is already a proven fact, and of far-reaching implications. Who knows, but what 1950 may see but a 1,000 hp. Diesel switcher and the single 1500 A & B All Purpose Road Diesel Unit as standard.



Rio Grande "Prospector" passing a steamer near Moffat Tunnel, Colorado.

DIESEL SHIP "GRIPSHOLM"

**"Long Range Navigation,"
Now Off "Secret List," Avail-
able For Commercial Use.**

LORAN, electronic "stop-watch" which makes it possible to determine quickly and accurately the position of a ship at sea, will be standard navigational equipment on ocean-going vessels by 1950, it was predicted by Omar B. Whitaker, marine sales manager of Sperry Gyroscope Company, Inc, at a recent demonstration of "Long Range Navigation."

Lifting of war-time restrictions, which had kept Loran on the United States Navy's "top secret" list, opens the way for the installation of the equipment on merchant ships as soon as the sets can be turned out. The first commercial installation already has been made on the Swedish-American luxury liner *M/S Gripsholm*, which docked late in February in Jersey City with repatriates from the Mediterranean, after a highly successful round-trip voyage with Loran.

The Sperry Loran shipboard receiver shown at the demonstration resembles a small, home television receiver. The top instrument panel is only a bit more than a foot square, and contains a series of knobs used for selecting and matching two green signals on a cathode-ray scope, and a "time-difference meter," which automatically computes to a millionth of a second the time difference in which radio signals, transmitted from two shore-based stations, are received at the ship.

This figure in micro-seconds, applied to special Loran navigational charts, makes it possible to arrive at an accurate "fix" in as little as two minutes. The "time difference" meter is a new



The Diesel ship "Gripsholm" was the first commercial vessel to have a Loran installation. Insert above shows the control panel of the direct-reading Sperry Loran Receiver-Indicator.

development in Loran. The Sperry set on the "Gripsholm" is the first to put it in actual operation. Loran solves practically all of the navigator's age-old problems connected with determining geographical position at sea.

"For centuries, navigators have been coping with the problem of fixing their position, regardless of weather," Mr. Whitaker pointed out. "Celestial observation, when sun or stars are visible, is accurate enough with a good navigator taking the readings. But in bad weather, when no readings are obtainable, the navigator must plot his course by 'dead-reckoning.' High winds and changeable currents might carry him miles off course before clear weather presents another opportunity to check his position."

The Sperry Loran is so accurate and so simple to operate that it makes methods now in use on merchant vessels seem "antiquated." The

ship's position can be determined, day or night, regardless of weather conditions, in from two to six minutes. Good navigators require 20 to 40 minutes to get their bearings with methods now in use.

Clifford W. Davis, former Loran officer for the U. S. Navy at Pearl Harbor, who is now associated with Sperry, explained the technical aspects of the Loran apparatus and demonstrated how the navigator arrives at a "fix."

Loran transmitting stations, of which there are more than 40, broadcast accurately-synchronized radio "pulses" or signals continuously over most of the principal shipping lanes of the world. The stations operate in pairs, usually 200 to 400 miles apart. The original signal is transmitted by the "Master" station. The "Slave" station receives this and repeats the signal.

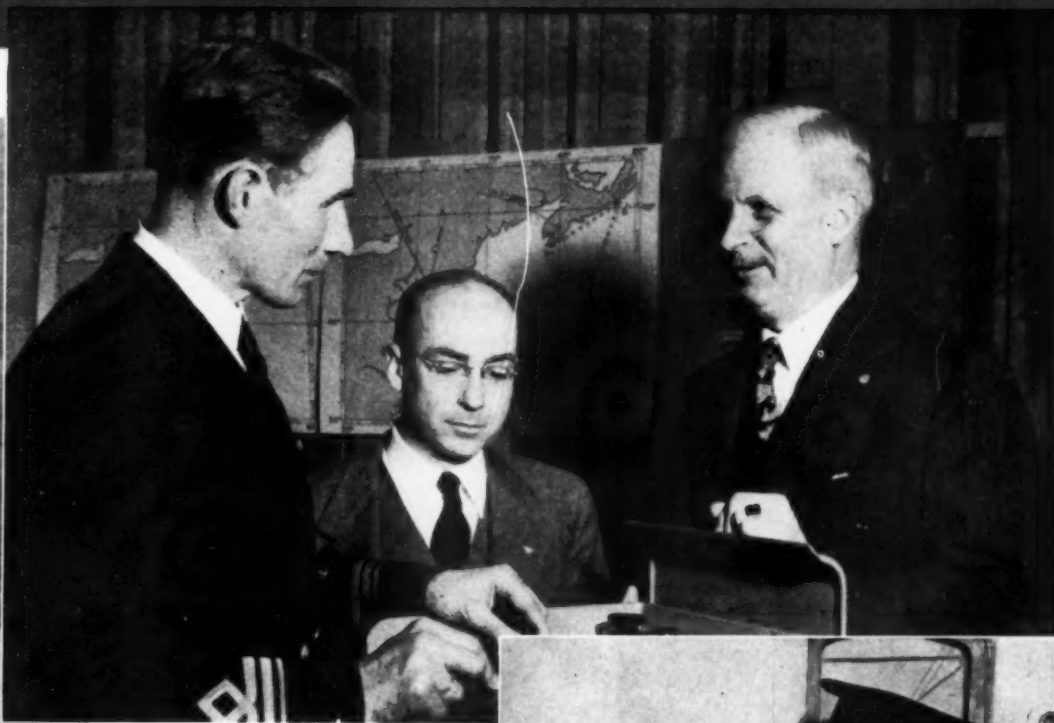
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EQUIPPED WITH SPERRY LORAN



Left right: Navigation Officer Hilmer Lundquist, of the "Gripsholm." Discussing the Sperry Loran shipboard receiver with Clifford W. Davis, former U. S. Navy Loran Officer, and Omar B. Whitaker, Sperry Marine Sales Manager.

Captain Harry C. Nordenson of the "Gripsholm" checking his position on the Loran chart.



Interior view of a typical Loran transmitting station showing men on watch at the timing equipment.



the Loran shipboard receiver, and the time difference is measured by lining up the signals visually on the cathode-ray scope. Operation is greatly simplified on the Sperry Loran, which computes the difference in time of arrival of the signals to one-millionth of a second on the "direct-reading time difference meter."

Mr. Davis explained that the navigator uses this information to determine a "line of position" on the Loran charts or from tables. The intersection of lines of position from two or more pairs of transmitting stations gives a Loran "fix." Range of the stations is about 750 nautical miles in daytime and about 1400 miles at night.

Preston R. Bassett, president; Charles M. Green, vice-president and general manager; and George S. Starke, general sales manager, were among the executives of the Sperry Gyro-scope Company who attended.

NEW LUBRICATION CONTROL SYSTEM

By BRUCE C. SISSON

A CONVINCING answer to the problem of Diesel lube maintenance has been worked out in the power plant of the Bowling Green Offices at 11 Broadway, New York City, where two Diesel generating units carry a good proportion of the building's electrical load. This new development by Ray-Eaton Company, Inc. comprises a low-cost and efficient method of re-refining Diesel lubricating oil right on the spot. The process now in its final stages of development should prove of interest to all practical Diesel engineers who are faced with the problem of satisfactory and efficient lube oil maintenance. The process is essentially a vest-pocket refining operation utilizing a still, approximately the size of a washing machine.

The first step in this interesting process is the mixing of a quantity of dirty oil with activated finely-divided clay to form a slurry. This is a simple operation performed in a special slurry tank which is equipped with an agitator. When this mixture or slurry has become homogenized, a combination liquid level and temperature limit switch is sufficient to energize the entirely automatic operation of the system. Two pumps, operating from a single shaft introduce the dirty oil and slurry into the still in the proper proportions until the liquid level switch within the still activates a solenoid valve which shuts off the pumps. The heating element within the still then takes over and gradually raises the temperature of the mixture.

At the same time compressed air is allowed to agitate the oil and slurry mixture to promote the anti-acid action of the clay particles. As the temperature within the still rises to its maximum of 500°F. the more volatile elements of the dirty oil, such as water, Diesel fuel and cracked carbon molecules, vaporize and are carried off through venting pipes to a condenser or stack. When the peak temperature has been attained, a thermostatic control, operating through solenoid valves, closes the vent, shuts off the heater, and introduces compressed air to the still at approximately 25 psi. thus forcing the heated oil out of the still and through a filter. Because of the high temperature of the oil and its resulting low viscosity, paper elements are admirably suited as the filtering medium. The oil reclaimed by the process can be favorably compared to new oil. It has good color, low neutralization index, and is free from any dilution. The cost is 2 to 3 cents per

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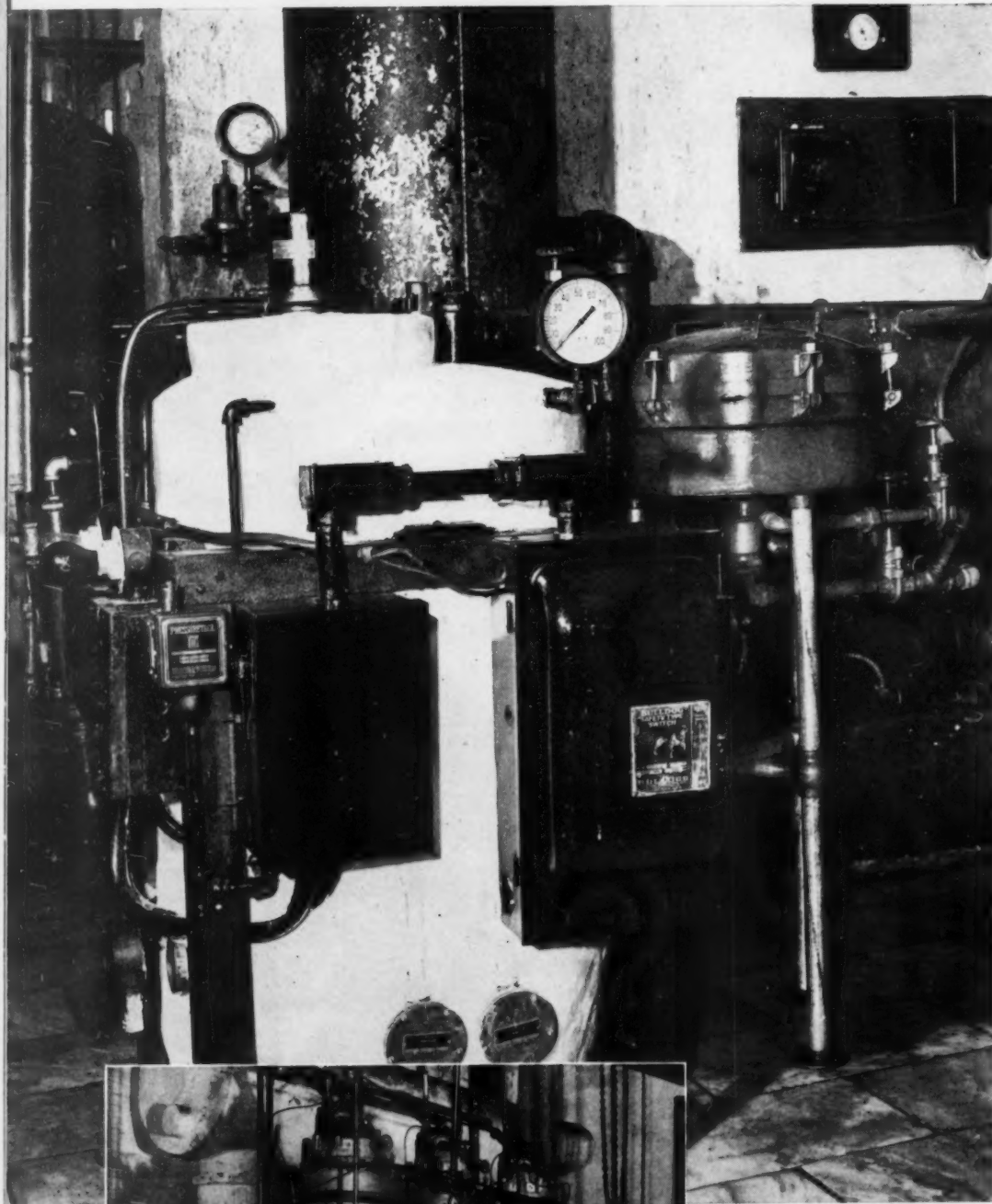
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Re-refining still by Ray-Eaton Co. Filter is seen, right center.

Venn-Severn Diesel at Bowling Green Offices, New York City.

gallon of reclaimed oil. The particular unit described here can handle 120 gallons of used oil every eight hours in batches of 20 gallons. The only manual work required for continuous operation is that of changing the filter medium once every eight hours and that of refilling the slurry tank at the same interval—operations which take one man approximately 15 minutes.

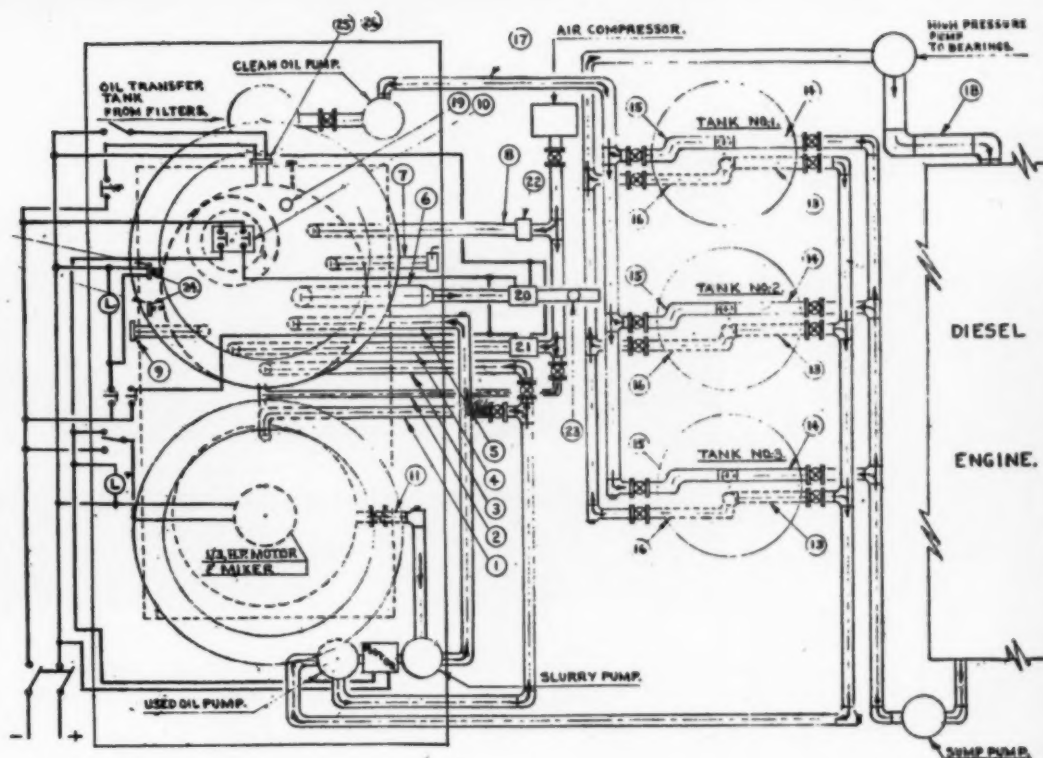
The system of lube oil maintenance, as worked out in this plant, provides for a complete change of oil in both Diesel units every second day which is equivalent to 28 hours' operation.

The method has paid off in economy, for in the past seven years the total maintenance cost for the 480 hp. Ingersoll-Rand Diesel has been less than \$500. And furthermore, none of this cost is charged to lubrication failure. The sturdy old Venn Severn 3-cylinder type D Diesel has been rejuvenated by the new system of lubrication control.

The reasons presented by Ray-Eaton Co., Inc. for the complete change of Diesel lubricating oil at close intervals are several. Mr. Ray believes that partial control of lubricating oil is inadequate for full protection. If all of the crankcase oil is made clean by re-refining at definite intervals there is no need to fear dilution or acid forming chemicals which will gradually require the complete replacement of oil. Once the engine is clean it may be kept clean for an indeterminate period, since no sludge deposits are allowed to form.

Although the current procedure of completely renovating the lubricating oil at the end of each 28 hour period is still in effect Mr. Eaton believes that the effectiveness of the system would be unimpaired by increasing the operating time to fifty hours between changes. This, however, would be a function of operating conditions in each individual installation.

These two Diesel generating units are producing current at 7 and 9 mills per kwh. for the large and small outfits respectively. Compared with four Uniflow steam units operating in the same plant at a cost of $1\frac{1}{2}$ to $1\frac{1}{4}$ cents per kwh., this is a splendid showing for the Diesels. There is no doubt but that the effective and systematic re-refining of lube is a large factor in the low cost production of current by these Diesel engines.

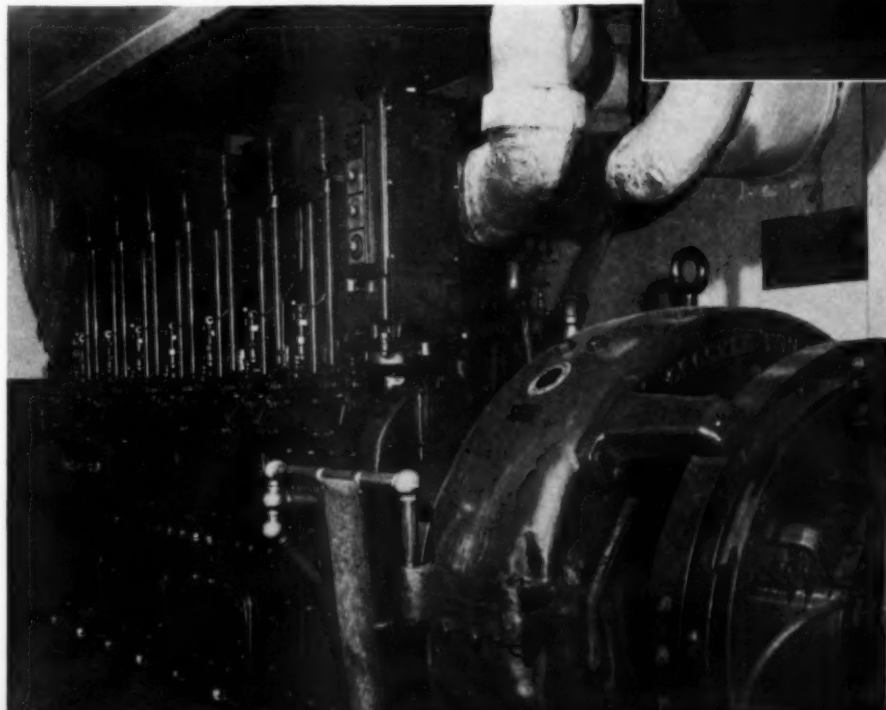


Diagrammatic sketch by Ray-Eaton lubrication control system showing piping and electrical controls. (See symbol table below).

1. Used oil line to slurry tank.
2. Air lines to filters.
3. Used oil line to still.
4. Air pressure line to still.
5. Slurry line to still.
6. Vent line from still.
7. Safety valve on still.
8. Air mixing line to still.
9. Pressure gauge on still.
10. Float in still.
11. Slurry line from slurry tank.
13. Suction used oil lines from storage to still.
14. Recirculating lines from sump pump to storage tanks.
15. Clean oil lines into storage tanks.
16. Clean oil lines from storage to bearings.
17. Clean oil lines from filters to storage tanks.
18. Diesel manifold line.
19. Emergency opening for smothering line.
20. Solenoid valve on vent.
21. Solenoid valve on air pressure line.
22. Reducing air valve.
23. Water vacuum column.
24. Heaters.
25. Thermostat
26. Thermometer

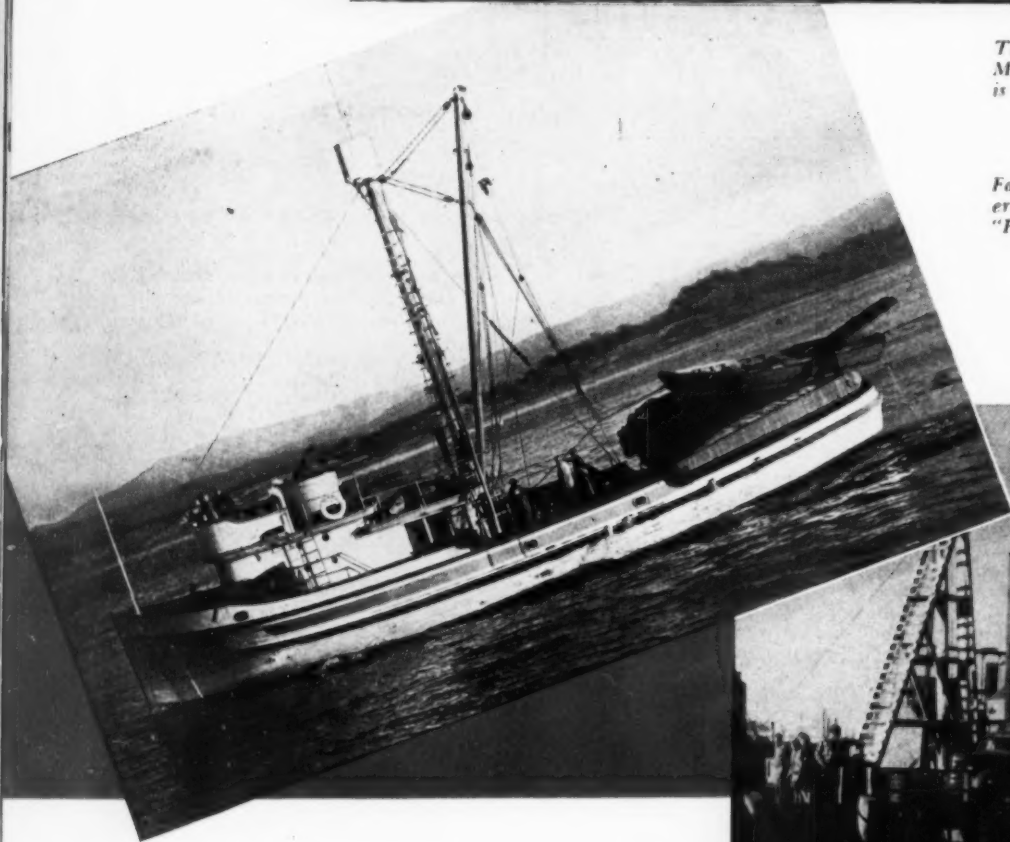
480 hp. Diesel generator which has had low maintenance costs with new controlled lubrication.

Diesel instrument panel showing Levelometer, Alnor pyrometer and air, water and lube oil gauges.

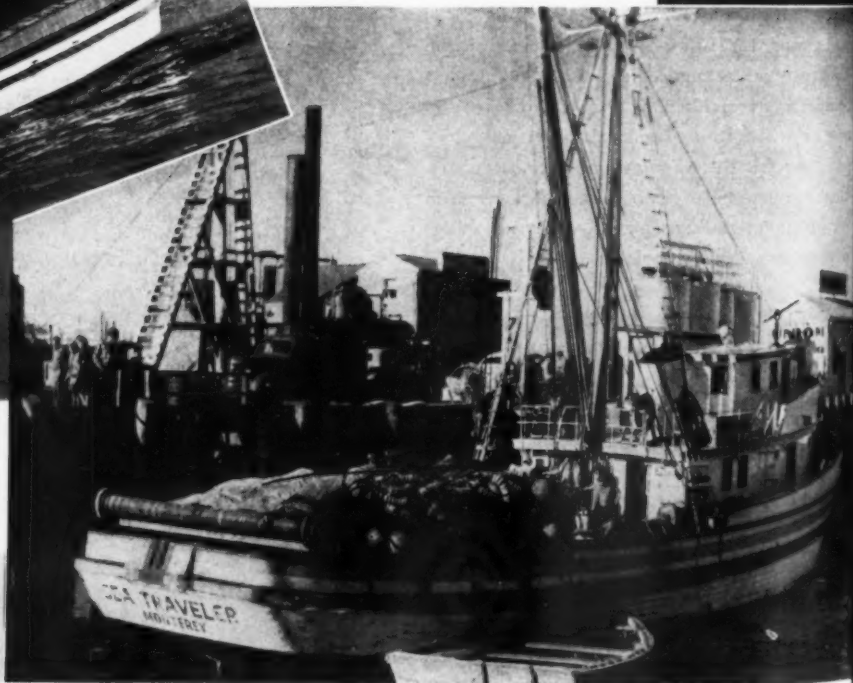




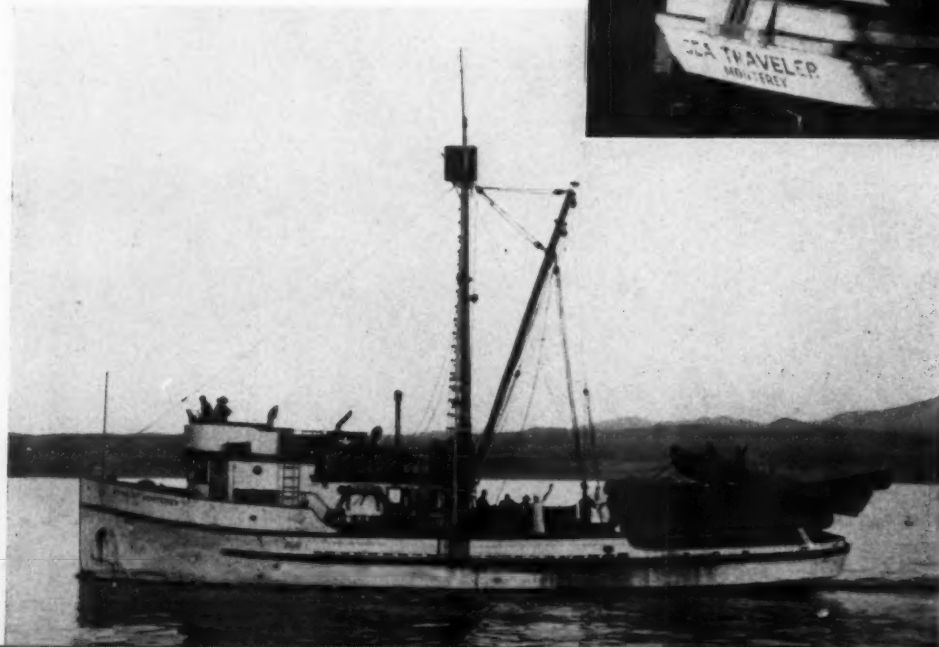
This purse seiner, owned by Mineo Brothers of Monterey, is Atlas powered.



Fairbanks-Morse engines power this tuna clipper, the "Petrina F." out of Monterey.



The tuna boat, "Sea Traveler," alongside Monterey docks. She's Enterprise engined.



A Washington Diesel makes the "Star of Monterey" worth many times her weight in sardines.



By F

MONT history" back spots as Plym is so modern Diesel-engine to the bone and back weather.

Your Old R Bay to learn is all about. Horace Merc Association.



Fishing boats at anchor in Monterey Bay. In the group are Lorimer and Superior Diesel-driven boats. Smaller boats in foreground also utilize Diesel drive.

DIESELS MAKE BIG BUSINESS IN LITTLE FISHES

By F. HAL HIGGINS

MONTEREY Bay dates its "white man history" back beyond such hallowed East Coast spots as Plymouth Rock. But its sardine fishing is so modern it leads the world, old and new. Diesel-engined sardine fishing boats cut costs to the bone and get the fishermen out to sea and back with a paying catch regardless of weather.

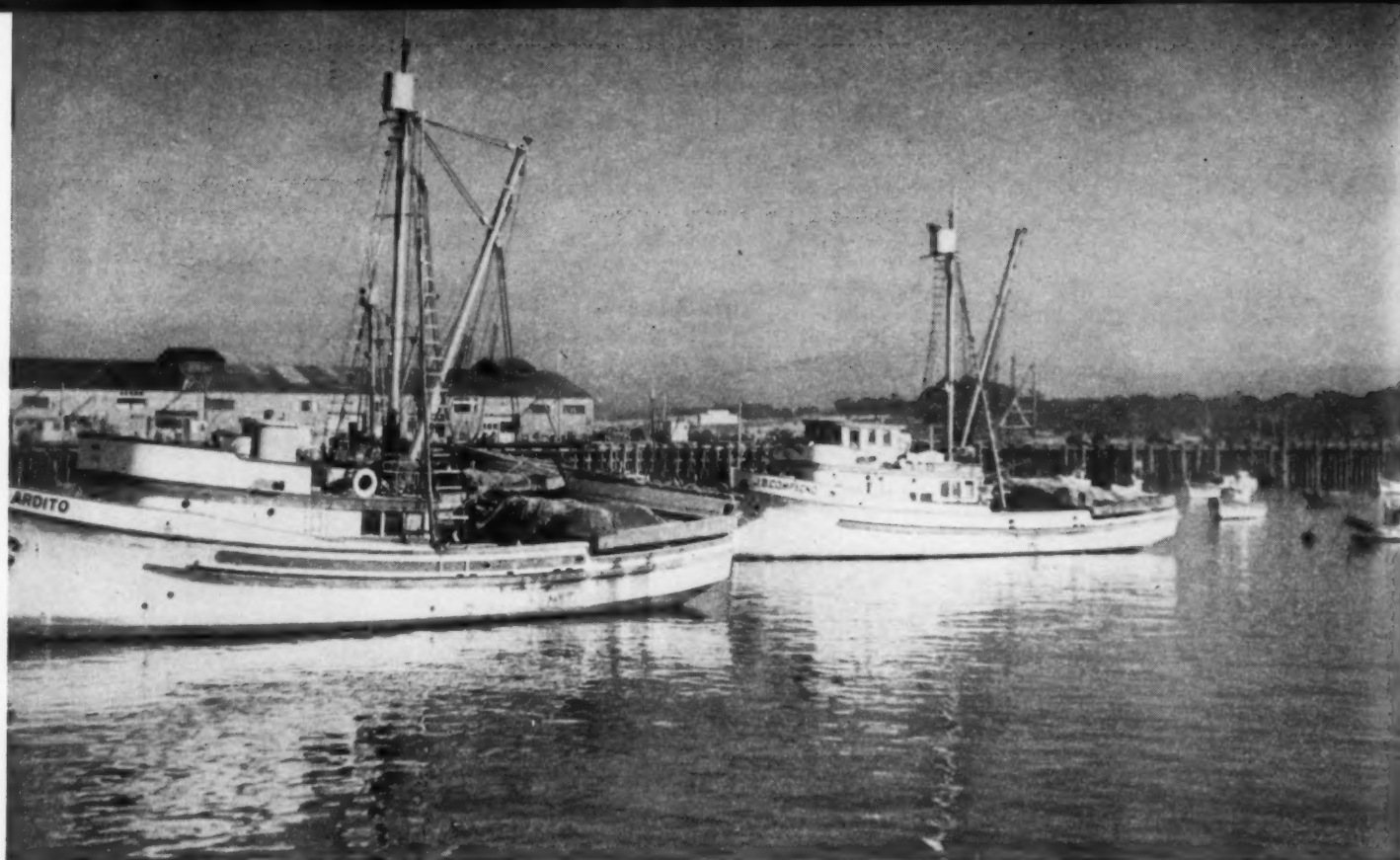
Your Old Reporter recently visited Monterey Bay to learn what the Diesel story on sardines is all about. He started with an interview with Horace Mercurio, secretary of the Sardine Boat Association. This association has 70 members

and 77 boats—all Diesels! That statement indicates that the Diesel has made so good it is the only source of power in this important industry that was so essential to the war effort that many of the fishing restrictions put on off-shore fishing were lifted to keep it producing this valuable food.

"The first Diesel to go into a Monterey Bay sardine boat was in 1925, I believe, when an Atlas 50 hp. went into a 50 ft. boat. By 1930 we began to build the big boats and Atlas, Washington, Enterprise, Union and other makes of engines began going into them. There have been and are other installations: Cummins, Buda, Fairbanks-Morse, Caterpillar, General Motors, Hercules, Gray, etc.

"The sardine industry and our Association has plenty of post-war problems. This past year was one of the worst in our history. The California coast is now infested with sea lions. British Columbia put a bounty on them in their waters and that seems to have chased them down here.

"What we need now is a scientific study of this seal situation and we are sending an appeal to the California legislature for help through the Fish and Game Commission that has done such a good job on wild ducks for the rice growers. Our boats go out and attract as many as several hundred sea lions around one fishing boat. Naturally, the seals get the sardines instead of us.



Union and Enterprise Diesels drive these boats on their ocean quest for tuna. Note crow's-nests used to locate schools of fish.

"We changed from gasoline to Diesels for economy reasons, of course. But we gained other advantages that every fisherman appreciated: better engine performance because of less rusting from salt water that caused lots of trouble in the ignition systems of the gas engines; fire hazard reduced greatly to cut insurance rates and danger to life and boats. Briefly, Diesels cut 30% off operation costs of our boats."

So, the writer went with camera to look around the bay and see how many Diesel sardine boats were in the harbor. The camera shots tell the story.

Here are a few of the Diesel sardine boats we saw on Monterey Bay.

American Rose	Enterprise Diesel
Anna A	Atlas Diesel
Ardito	Enterprise
Belvedere	Fairbanks-Morse
Betty Ann	Cummins
California Rose	Atlas Diesel
California Star	Enterprise
City of Monterey	Enterprise
C. R. Martinovich	Enterprise
Diana	Atlas
El Capitan	Enterprise
Endeavor	Enterprise
E. S. Lucido	Enterprise
Il Commodore	Atlas

Jackie Boy	Atlas
John R.	Atlas
J. B. Compango	Union
Key West	Enterprise
Little Flower	Enterprise
Lena VII	Enterprise
Lina V.	Enterprise
Mineo Bros.	Atlas
New Hope	Fairbanks-Morse
New Madrid	Atlas
New Marettimo	Enterprise
New Roma	Atlas
New Saturnia	Atlas
New Limited	Superior
Pacific Star	Atlas
Paulina T.	Atlas
Petrina F.	Fairbanks-Morse
Sea Giant	Enterprise
Sea Traveler	Enterprise
Santa Maria	Union
Serra	Atlas
Santa Rita	Washington
Sea Boy	Enterprise
Santa Ana	Enterprise
Sea King	Lorimer
Serrito Bros.	Atlas
Star of Monterey	Washington
St. Anthony	Fairbanks-Morse
Stella Morris	Enterprise
Twin Brothers	Enterprise
Vagabond	Enterprise
Vivian A.	Enterprise

Let the Monterey Chamber of Commerce give you the statistics on the sardine industry, as

the industry is so important it gets an annual special edition of the local daily paper, which the Chamber of Commerce and George Clemens, Executive Secretary of the Monterey Fish Processors' Association, help compile and edit:

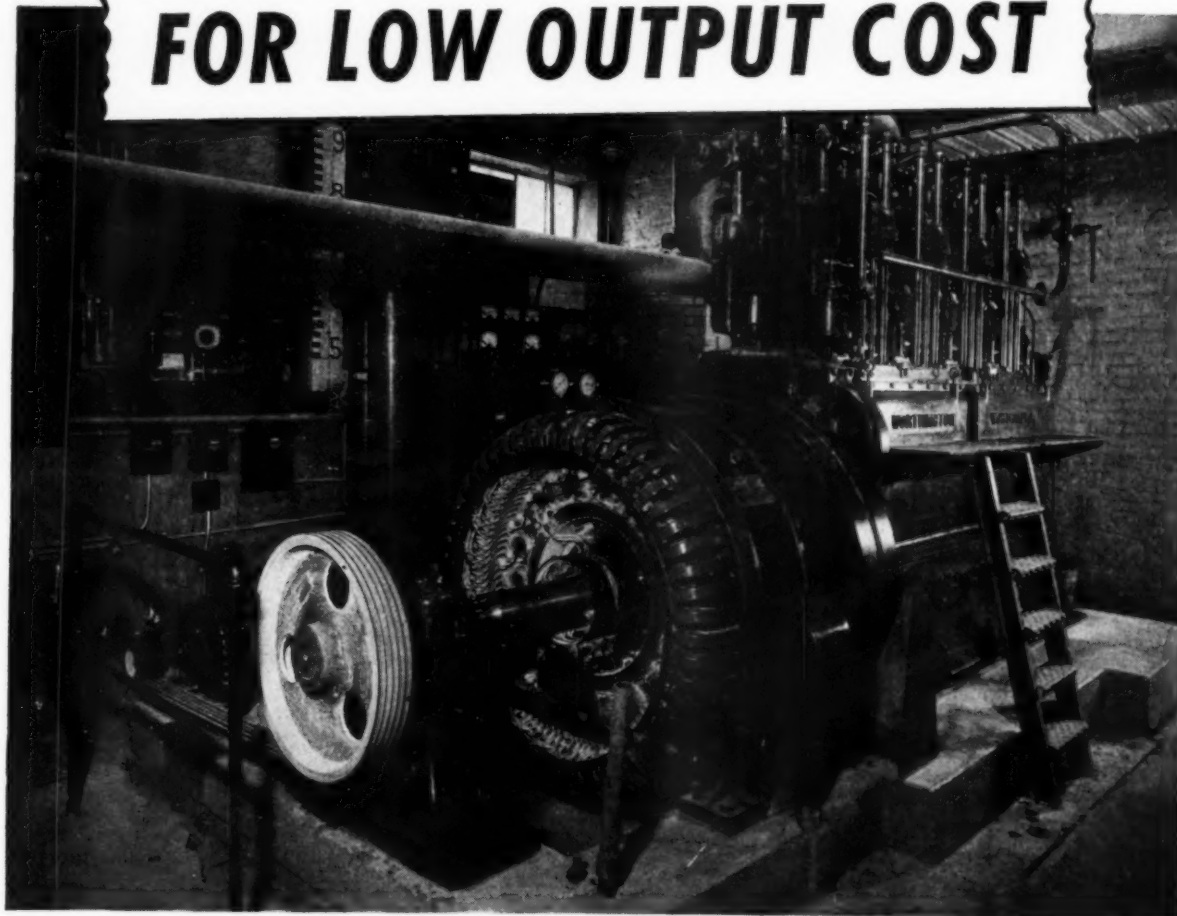
"Monterey harbor is the home port for a fishing fleet which has made this California town the largest fishport in the United States in point of annual tonnage and the third largest in the world.

"The sardine industry, representing a \$5,500,000 concern composed of ten canneries and two exclusive reduction plants, did an annual business of \$22,000,000 for 1944. Tons landed, 234,613; standard cases packed 1,659,053; sardine meal (tons) 34,920; sardine oil (gallons) 8,305,401. Payments to the fishing fleet total \$5,220,139; general packing plant payrolls were \$2,307,513.

"The entire pack of canned sardines was under contract to the United States Government and is being shipped as food under the lend-lease agreement. The canned sardines are of excellent food value due to the high mineral and vitamin content. Meal is used as a protein supplement for poultry and livestock. Sardine oil, under modern processing, can be reduced to the point of being colorless, odorless and tasteless."

SINCLAIR GASCON OIL

FOR LOW OUTPUT COST



OTHER factors remaining constant, maintenance charges can determine output cost. Lubrication is an important factor in the power production of Diesel engines.

Sinclair GASCON OIL possesses *natural ability*—due to inherent qualities—to disperse carbon formation, discourage crankcase accumulation and ring sticking, and thus guard against lubrication deficiency and costly shutdowns.

Mechanical failure costs money 2 ways: (a) cost of repairs (labor and parts), (b) loss of revenue output. Let us counsel you on how to guard against lubrication failure with Sinclair GASCON OIL.

SINCLAIR INDUSTRIAL OILS

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE SINCLAIR REFINING COMPANY, 630 FIFTH AVENUE, NEW YORK 20, N. Y.



At work on the Canton-Akron, Ohio, memorial airport, this Caterpillar Diesel tractor with LaPlant-Choate scraper hauls 7 to 8 yds. on 2000 ft. trip—moving 56 yds. per hour.



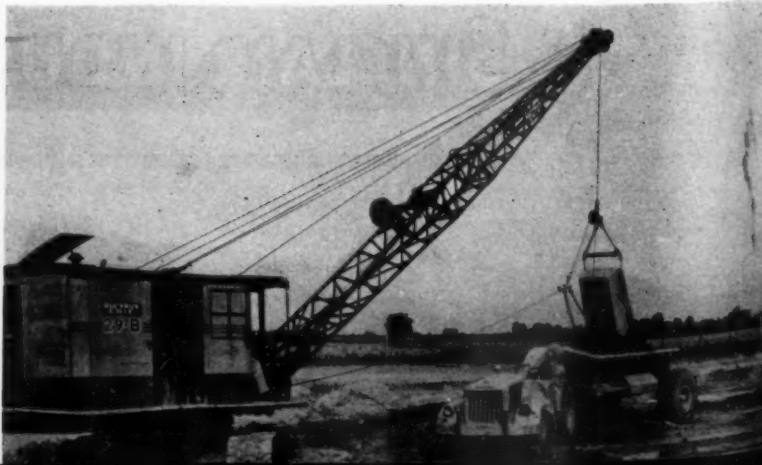
Spreading new material on fill during reconstruction of Highway No. 40 near Dunreith, Indiana.

Same equipment and job as seen next above—uses 2 gal. of fuel per hour—working 12 hours a day.



DIESEL HIGHWAY RECONSTRUCTION GOES ON APACE

Another scene on Route 40 with Bucyrus-Erie dragline powered by Caterpillar Diesel, loading a Diesel-hauled 8 yd. wagon.



WHY PROTECTOMOTOR AIR FILTERS ARE BEST FOR DIESEL ENGINE USE



★ HIGH EFFICIENCY WHEN INSTALLED

Protectomotor Air Filters for internal combustion engines and compressors feature dry-type filtering media. These media are selected to fit particular installation conditions. They have been scientifically tested in the laboratory and proven by field use. Used in combination with the patented Radial Fin Insert Construction, they provide highest operating efficiency.

★ INCREASED EFFICIENCY WITH USE

Protectomotor filtering efficiency actually increases when dust begins to accumulate on the surface of the media, since this forms a pre-coating or filter-aid of the very material which is being handled.

★ LOW RESTRICTION TO AIR FLOW

Protectomotors at maximum ratings offer initial resistance to air flow of less than $\frac{1}{2}$ " of water. Since the exclusive Radial Fin Construction provides a maximum of filtering area, this resistance is held to a minimum throughout the life of the filter.

★ SERVICING SELDOM NECESSARY

The Protectomotor is a masterpiece of simple, rugged construction. There are no moving parts, no reservoirs, no liquids. The extremely large active filtering area reduces cleaning to an absolute minimum for any given set of conditions. When required, cleaning is quickly and easily accomplished by vacuum, compressed air, or washing.

★ POSITIVE PROTECTION ★ ★ ★ ★ ★

Inherent characteristics of the dry-type filtering media provide positive protection. Performance is not dependent upon periodic renewal of viscous coatings or other filter aids. Ideal for dust storm areas.

★ EFFICIENT AT HIGH OR LOW TEMPERATURES

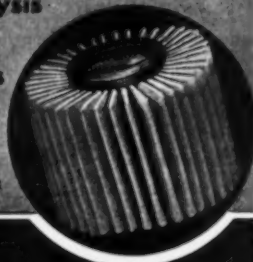
As the filtering media used are of the dry-type, peak efficiency is maintained under all atmospheric conditions. There is no oil to evaporate at high temperatures or to congeal at low temperatures.



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SUPERVISING & OPERATING ENGINEERS' SECTION

Conducted by R. L. GREGORY*

"TROUBLE SHOOTING"

ONE of the essential characteristics of a good operating engineer should be his ability to "shoot trouble" in an emergency. This is particularly true in the smaller plants where the operating and maintenance personnel are limited and especially in plants where the maintenance work is normally carried on during the day shift, and when maintenance men are not on duty during the remaining sixteen hours of the day, even though the plant is operating.

Many operators feel that their duties lie merely in the keeping of the operating log, starting or stopping units as the load demand either increases or decreases, and in keeping an eye upon the operation of the units. But their duties should go farther than this. In most every plant, regardless of the type of prime movers involved, occasionally a crisis arises which calls upon the ingenuity of the operator to keep the units operating and avoid service interruption.

It seems paradoxical that these interruptions in normal operation usually occur in the off hours, or at a time when a minimum of personnel is at hand to correct the trouble, such as on the late evening shifts or early morning tricks. There are probably no more interruptions on these shifts than there are on the day shift, but they become more noticeable because of lack of personnel at the time of occurrence.

Therefore, more serious delays can often be averted if the operator on a shift is an expert "trouble shooter" and can locate the cause of trouble with a minimum of delay. Some operators will say, "Well that isn't my job, that is why we have maintenance men, and consequently I am not interested in that phase of the work." Perhaps that operator feels that way, and as far as general maintenance is concerned, he may in a measure be right. On the other hand, if he can take immediate notice of developing trouble or if he knows what to do at the proper time, he may often save a much more serious incident from developing, and being able to carry on in this manner, becomes

more valuable as an operator. Therefore, the fact that he is able to shoot trouble as it occurs or is in the process of development is an asset.

Now in order to be a good "trouble shooter," one of the first requisites is a thorough knowledge of the unit and to use a slang phrase, "know what makes it click." He must not only understand the integral parts of the unit, but he should understand the function of each part and the relationship of those functions—one with another, and the resultant effect upon the unit and its operation as a whole, in case any certain part fails to function properly. He must also know what signs to watch for, which denote failure of a part, and in turn must know what methods to use to correct these failures. I grant that that is a task which requires a lot of study and concentration, and such knowledge cannot be attained overnight, but must be acquired by continued observation and study of the unit and its parts.

As we all know, the proper working of a Diesel unit depends on many conditions, some distinctly separate, and others decidedly dependent one upon another. The basic principle of Diesel operation depends upon the efficient conversion of fuel energy into power, and in completing this conversion several other factors must be taken into consideration, such as the energy content of the fuel used, the actual amount of fuel consumed, compression, efficiency of combustion, mechanical condition of the unit, and the efficiency of the fuel mechanism and injection system.

First let us consider the energy content of the fuel. This varies with the type of fuel used and since there are many types of fuel available for Diesel operation, we must go further into the matter because the energy content varies with the specific gravity. Assuming that one is familiar with the specific gravity of the fuel and general analysis and is satisfied that he is using the proper fuel to get the best results from his unit, the next factor he must look to is the quality of combustion. One might have an excellent grade of fuel as far as energy content is concerned, but if combustion is not complete his operation efficiency is lowered. Consequently many units often

operate more efficiently on a lower grade of fuel where combustion is complete, than do units using a high grade of fuel with incomplete combustion. Hence in determining the operating efficiency of a unit, both these conditions must be taken into consideration.

The amount of fuel which can be efficiently handled depends upon atomization and combustion. Whether it is an air injection or a solid injection unit, air and fuel must be delivered in the proper amounts and the injection equipment and atomizer equipment be in such condition as to insure proper atomization. The temperature and volume of air must be right so that the mixture of air and fuel is such that complete combustion occurs. Here also other factors enter into the picture. It is essential to see that there is no restriction in the exhaust ports or lines, which will interfere with the escape of the exhaust gases. Exhaust gases remaining in the cylinder after each explosion should be at a minimum, because complete atomization and combustion cannot be expected to occur when exhaust gases from the previous explosion are partially blocked off and allowed to remain as a back pressure against the ensuing explosion.

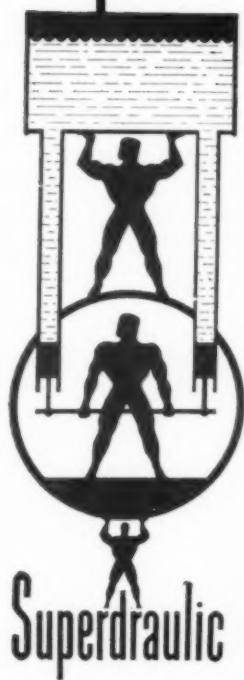
Such a condition might be comparable to a man rowing a boat upstream against a strong current, the current representing the blocked exhaust gases, with the energy the rower exerts on his oars being comparable to combustion and the resultant explosive energy. Were there no current the energy expended would propel the boat forward with greater speed. Thus were there no latent exhaust gases present in the cylinder or exhaust lines, the energy of combustion with the resultant explosion would be more effective.

Thus we see that efficient operation is the proper functioning of the various parts of the unit and various conditions affecting operation, one with the other. And in order to become a real trouble shooter, one must first understand these relationships and functions thoroughly. In the next issue various phases of trouble shooting will be discussed, certain causes and indications of trouble and how to locate them and correct the same.

* Chief Engineer, Municipal Water and Light Plant, Hillsdale, Michigan.

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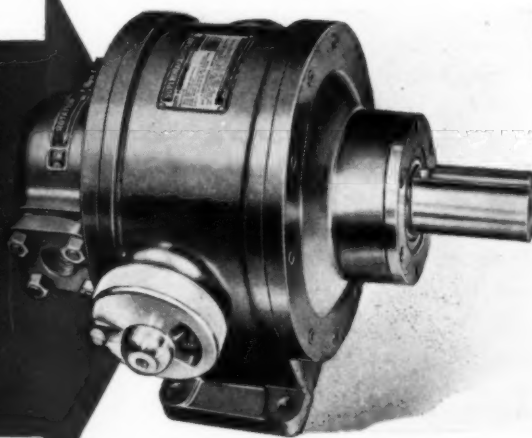
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Exchange Your Diesel Maintenance Ideas

Conducted by R. L. GREGORY

Editor's Note: In this department we provide a meeting place where Diesel and Gas engine operators may exchange mutually helpful maintenance experiences to keep our engines in top condition. Mr. Gregory edits your material and adds constructive suggestions from his own wide experience. This is your department—mail your contributions direct to DIESEL PROGRESS.

Easily Constructed Apparatus for Cleaning Fuel Storage Tanks

ONE of the more important jobs around any Diesel plant is that of keeping the moisture and sludge content of the fuel storage tanks at a minimum. Figure 2 is a sketch of the conventional type of outside storage tanks as generally constructed in installations which require considerable capacity in fuel storage equipment. Most of these tanks are placed vertically in position, with approximately 2/3 of the tank below ground level.

With such an installation it sometimes becomes quite difficult to install "drainoff valves" or lines for draining off the moisture and sludge from the bottom of the tank. Usually, in such installations, two suction lines are installed, one of which ends anywhere from three to six feet off the bottom of the tank and which is used for a suction to the transfer pump in supplying oil to the plant. With the suction line so installed, considerable sludge and moisture can settle in the bottom of the tank without being pulled out by the transfer pump. However in many tanks, a second suction line is installed, which is known as the "sludge suction line." This line usually extends to within approximately 6 in. of the bottom of the tank, and is so interconnected with the regular fuel suction line, that the same transfer pump can be used for sludge and moisture removal.

This is done by having a properly piped system on the discharge side of the transfer pump, whereby the sludge and moisture can be bypassed and kept out of the regular discharge line going to the plant. However this is not shown in Figure 2 but is replaced by an easily constructed suction line (portable) which will allow the removal of practically all the sludge and moisture in any tank of this type. It is so designed that it may be moved from tank to tank, one piece of apparatus being all that is necessary for cleaning all tanks.

Figure 1 shows how this device is constructed. Two $\frac{5}{8}$ in. plates, 16 in. in diameter are secured, and assembled as shown. The top plate is drilled and tapped to receive a $1\frac{1}{4}$ in. pipe, which after being threaded and installed, should be welded to the plate as shown to give it more rigidity. The bottom plate is then bolted to the upper by means of four $\frac{5}{8}$ in. machine bolts, with pipe spacer ferrules placed over the bolts between the plates. The ends of these ferrules to be machined off squarely, so that the plates will pull down firmly on them.

The apparatus can then be lowered through the manhole until it rests on the tank bottom, with the pipe extending out through the manhole so that a hose can be attached to it as a suction line. The other end of the hose is attached to the suction side of a small rotary pump, motor driven, which when started up will suck the sludge and moisture from the bottom of the tank and in this manner practically all of the sludge content will be removed. The discharge hose from the pump can be emptied into barrels or any suitable

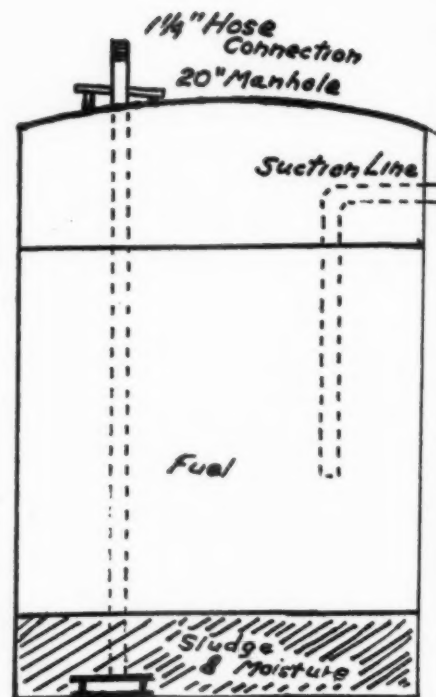


Fig. 2

containers used to cart it away. Sludge of this nature can be easily utilized for oiling roads, etc., and, if found to be well emulsified it can be reclaimed if available reclaiming facilities are handy for removing the moisture and sludge.

A screen can be used, if desired, as shown in Figure 1, but this depends a great deal on the type of fuel used. If the fuel is very heavy or contains heavy foreign matter, the screen might plug up, but with a fairly clean fuel where moisture forms the principal contamination, the screen is applicable. This apparatus is designed principally for storage tanks without any other means of proper sludge drainage.

Many storage tanks are equipped with heating coils installed around the suction pipes. When the oil becomes very warm, especially in cold weather, there is bound to be a great deal of condensation even with breather apparatus. This condensation drops into the oil and eventually settles to the bottom of the tank, where if not removed will eventually reach the suction lines to the transfer pump. If it is then pumped into the system trouble develops, especially in fuel oil filters in which fuller's earth, retrol or similar types of filtering materials are used, since the moisture will clog the filters and they will become inoperative.

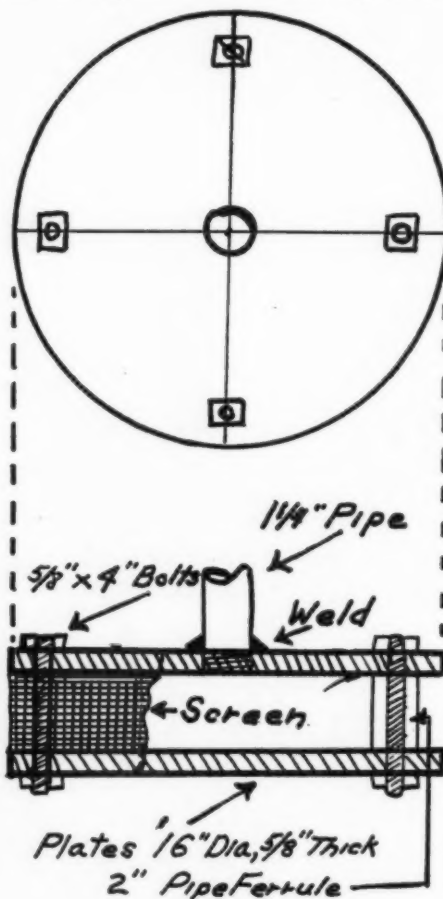
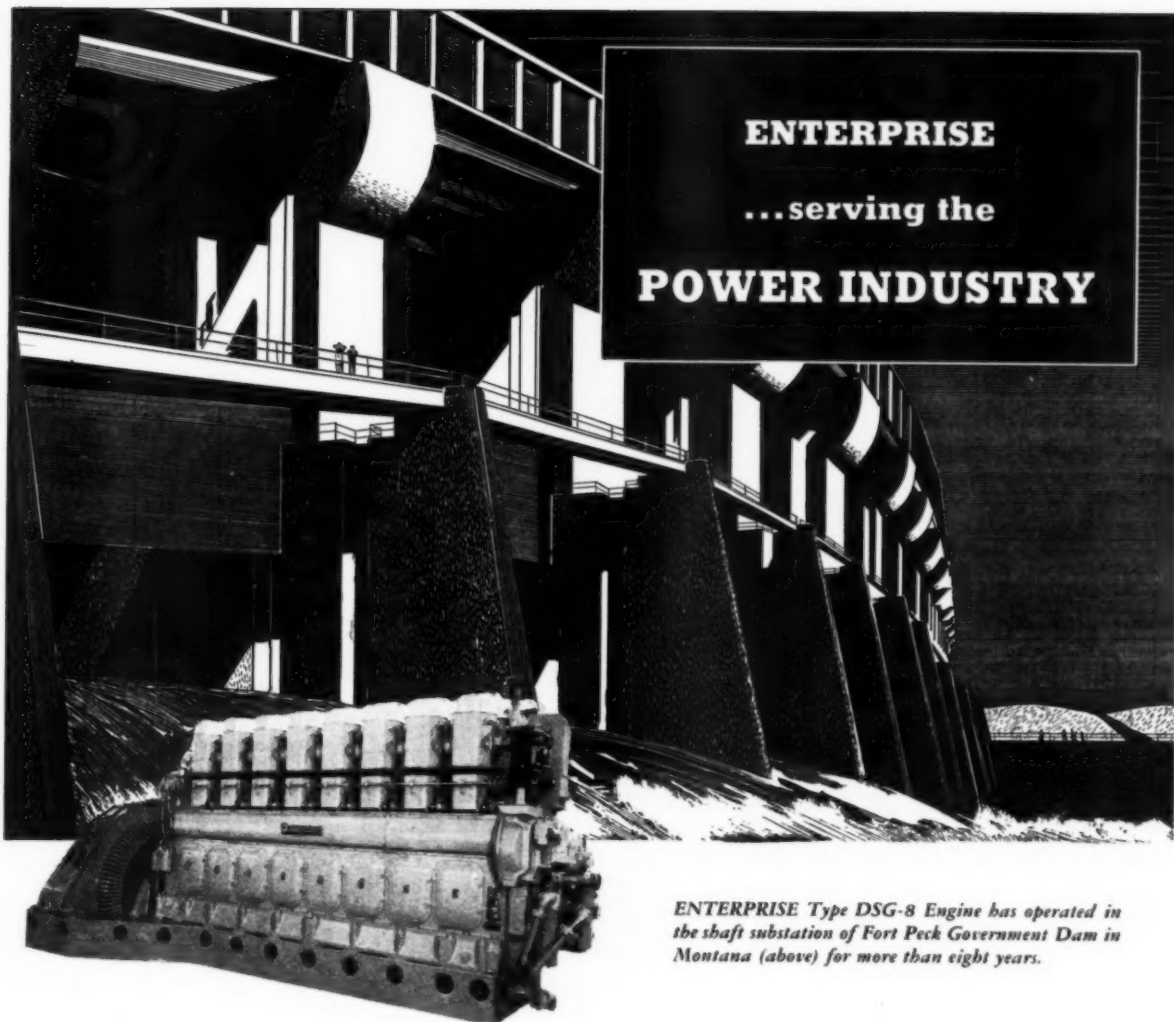


Fig. 1



ENTERPRISE Type DSG-8 Engine has operated in the shaft substation of Fort Peck Government Dam in Montana (above) for more than eight years.

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Sterling Engine Company Opens Branch on West Coast

IN the interest of better serving the territory West of the Rocky Mountains, The Sterling Engine Company has announced the opening of a direct factory branch in San Francisco. Hans Bohuslav will be in charge of the new Branch and will continue to direct the company's engineering and research, dividing his time between Buffalo and the West Coast. The address of the new branch is Russ Building, San Francisco, California.

Korfund Announces New Vibro-Isolator

A NEW type LK Vibro-Isolator is announced in a four-page bulletin of The Korfund Company, Inc.

Type LK, a simplified steel spring vibration isolating unit, is designed in 26 sizes for rated loads of 75-12,000 lbs. Adjustable resilient chocks in the four corners of the housing act as stabilizers. Properly installed and adjusted, Type LK provides efficient vibration control

for all impact machinery, stationary and marine Diesel engines, generators, panel boards, material testing and processing equipment, ventilating and air conditioning equipment, recording apparatus, business machines, and other industrial equipment.

Bulletin LK 550 with complete description and engineering data is available upon request. Write The Korfund Company, 48-15 Thirty-second Place, Long Island City 1, N. Y.

North Carolina State Offers Graduate Course in Diesel Engineering

THE establishment of a Graduate Department of Diesel Engineering and Internal Combustion Engines at North Carolina State College, Raleigh, N. C., has just been announced, with Prof. Robert B. Rice, director of Diesel training for the Navy's program at the college during the war and a member of the faculty of the college's Department of Mechanical Engineering, having been named to head the new department.

Announcement of the setting up of the school was made by Chancellor J. W. Harrelson shortly after the Navy announced that it had loaned the college more than \$2,000,000 worth of Diesel engines used during the wartime program there. The new department will specialize in graduate instruction and Diesel research. The Diesel engines and equipment loaned by the Navy are regarded as the largest and most modern collection in the world and are housed in a special building erected by the State of North Carolina during the war.

"There is an immediate need for well-trained engineers and designers in the Diesel engine field and this need will continue," a resolution approved by the school in setting up the new department stated. "North Carolina State College is now ready to provide leadership in an effort to meet these training and research needs, and looks forward to the support and cooperation of the Diesel industry to attain and carry out such a program," the resolution further stated.

The Department of Diesel Engineering will have three functions: (1)—Education at the graduate level, both for advanced degrees and for retraining of engineers now in industry; (2)—Research, both pure, long-range research and applied immediate research; and (3)—Operation of intensified programs (non-credit)—institutes dealing with specific needs of the industry.

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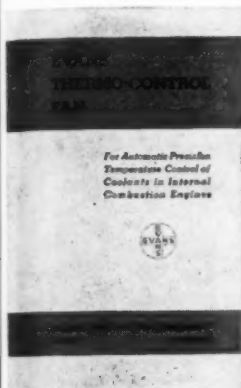
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HALLETT DIESEL ENGINE

Evans Products Company Releases Booklet on Thermo-Control Fan

IN a new booklet recently released by the Evans Products Company there is valuable information concerning the effect of fan operation upon engine performance. The booklet is presented in the form of questions and answers which covers most aspects of the problem of radiator type water-cooled internal combustion engines.



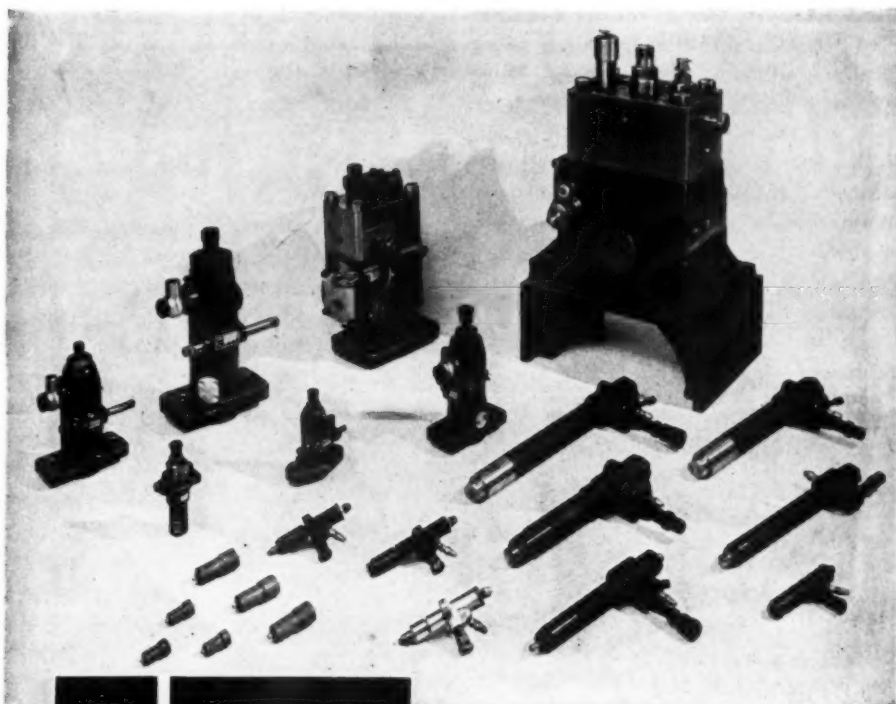
Evans Products Thermo-Control Fan Booklet

The Thermo-control fan is designed like a variable-pitch propeller in that it is automatically adjustable to any pitch. However, by utilizing a thermal control, the pitch is determined by the temperature of the coolant. Thus, with a cold engine, the pitch of the blades would be small, and gradually, as the engine approached its normal operating temperature the pitch would become greater until the engine was running at a constant temperature with the fan in constant control. The booklet contains interesting material on the effect of engine temperature upon lubricating oil and fuel consumption, and general engine maintenance. Full particulars may be obtained from the Evans Products Company, Detroit, Michigan.

New Publication on Magnetic Adjustable-Speed Drive

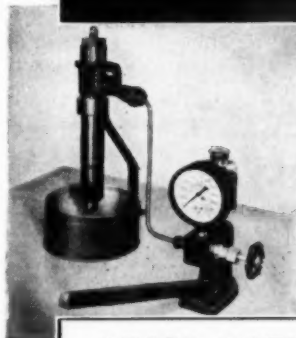
A NEW 16-page booklet, No. 183, printed in three colors, with factual data and over 40 illustrations covering the E-M Magnetic Adjustable-Speed Drive for boiler draft fans, centrifugal pumps, centrifugal blowers and compressors, and other loads where torque required decreases with reduction of speed. Principles of operation, performance characteristics, and applications are described and illustrated.

The E-M Magnetic Adjustable-Speed Drive is an electro-magnetic torque transmitter, placed between a constant speed motor and the equipment to be driven, to provide easily-adjustable, micro-step, wide-range control of speed. Published by Electric Machinery Mfg. Company, Minneapolis 13, Minnesota.



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Tom Sawyer Sees Bright Future For Diesel Locomotives

THAT from 20 to 40 per cent of all locomotives operated by American railroads in 10 years will be Diesels was the prediction made by R. Tom Sawyer, Engineer, Diesel Equipment, of the American Locomotive Company, in a recent address before the American Society of Mechanical Engineers.

Mr. Sawyer said, "If we add all switching and road locomotives in service today we find that

over 10 per cent are Diesels. This is unusually high, since this change has largely taken place in the past 10 years. In the next 10 years, this percentage should increase to at least 20 or even 40 per cent."

Comparing various types of motive power for railroads, Mr. Sawyer stated, "Each type of motive power will find its own place. No one is going to push one type more than another unless it pays to do so and the railroads will put that type of locomotive in service which

gives them the greatest return on investment. This means that the railroads will use Diesels for all switching operations, with few exceptions. The Diesel will have to fight its own way in main line road service with the steam locomotive and, eventually, the gas turbine as competitors. The class of service required by the local conditions of the railroad will largely determine the most economical type of motive power."

On the subject of electric motive power, Mr. Sawyer said, "The electric locomotive has made an excellent record in congested areas, but there is practically no extensive electrification that is not backed up by the steam locomotive or the Diesel."

In addition to gas turbine power, Mr. Sawyer predicted that Diesel locomotion would some day face competition from atomic energy. On this subject he commented, "The Diesel locomotive can also expect competition in road service from an atomic-powered unit. This is no doubt a long way off, but I am convinced that it is coming."

Mr. Sawyer is a leader in the field of Diesel locomotive engineering. He assisted with the construction of the first Diesel locomotive sold in the United States in 1925. It was a 300 horsepower locomotive built by the American Locomotive Company and General Electric for the Central Railroad of New Jersey and is still in daily service.

OPA Ceilings

AS we go to press, our Washington News Bureau reports that it believes that price control on low-speed Diesel engines and Diesel locomotives may shortly be removed—possibly by the end of March, also; that ceilings on high-speed Diesels may be appreciably increased.

New-type Torsional Vibration Damper

THE Houdaille Engineering Division of Houdaille-Hershey Corporation has announced a new type of Viscous Torsional Vibration Damper for internal combustion engines which, it is claimed, solves torsional vibration problems. The new Houdaille Damper has already been accepted as a production unit by a large Diesel engine manufacturer.

Among the reasons cited for the interest which engineering circles have shown in the new Houdaille Viscous Damper are its simplicity, the fact that it is untuned and therefore mini-

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mizes both major and minor critical orders of vibration, and the claim that it will outlast the engine without maintenance or service.

Only three parts go into the construction of this new damper: the damper mass, its housing and a bronze bushing. The viscous substance employed is the newly-developed Silicone fluid, chosen for its inherent stability and its nearly flat viscosity curve which permits constant operating characteristics regardless of temperature ranges or changes. The housing is hermetically sealed to retain the fluid indefinitely.

It is pointed out that this new device is a true damper and not a detuner. The housing is attached rigidly to the engine crankshaft while the inner, free-running damper mass, in reality a fly-wheel, is separated from it by a thin film of the Silicone fluid. Because of the high viscosity of this fluid, the damper mass rotates at engine speed. When the minute plus and minus changes in velocity which produce vibration are transmitted from the crankshaft to the housing, the damper mass or flywheel, being heavy in comparison, tends to continue to rotate at constant speed. Thus the vibrations are damped by the drag of the viscous fluid separating the two parts and its resistance to the shearing action.

From an engineering standpoint, the amount of damping is a fourth power function of the diameter of the damper mass. For this reason the reduction in amplitude which is possible with this style damper depends upon the work input of the lowest order involved, the allowable physical dimensions of the damper, the permissible damper weight and the inherent damping of the engine. Since the damper is untuned, if it is constructed to satisfactorily reduce the order of largest amplitude, all other orders in the operating range will be correspondingly reduced. Over a wide range of speed where many orders are involved this is particularly advantageous.

Hydraulic Machinery Issues New Brochure

AN eight page brochure that completely outlines their greatly expanded facilities, has just been released by Hydraulic Machinery Inc. It describes the engineering, laboratory and production departments and illustrates typical examples of special and hydraulic machinery in addition to test equipment and hydraulic power units. . . . Detailed information is also available on each phase of this business. This booklet will be mailed free upon request to Hydraulic Machinery Inc., 12825 Ford Road, Dearborn, Mich.

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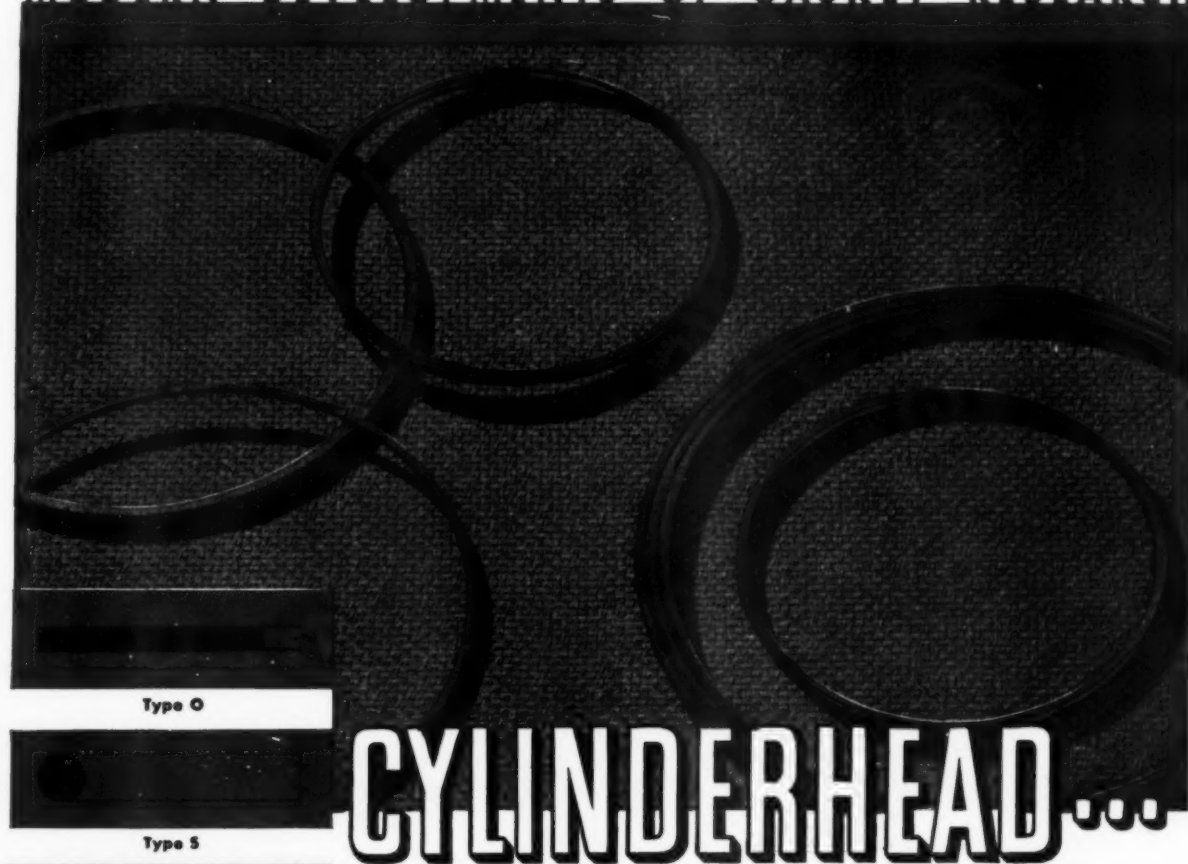
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MODERN DEVELOPMENTS OF GASKET RESEARCH



CYLINDERHEAD...

To supply modern Diesel Engine requirements, Goetze has developed and supplied a large number of standard and special Cylinder Head Gaskets. For instance, one group of machines has been turning out special copper marine engine gaskets at maximum production since one year before we entered the war — totalling many millions of gaskets that have done their small part in shaping the World of Tomorrow.

The design of Cylinder Head Gaskets varies widely according to individual requirements — square, round, diamond-shaped, in the standard types, and many special shapes predominate in solid metal gaskets. In addition, metal-jacketed asbestos types are also popular with many manufacturers and engine operators.

What are your requirements — standard or special?

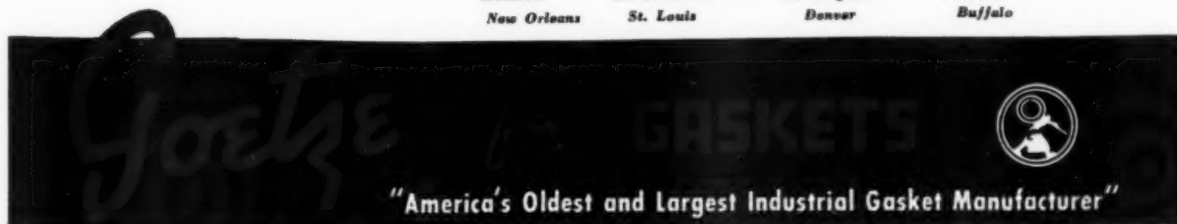
The illustrations above and at left give a partial picture of Goetze's facilities to serve you.

Write stating your problem. Also ask to have your name added to the list of engineers receiving "The Gasket" — a series of technical bulletins containing original gasket data emanating from the Goetze Research Laboratory. Write on your company letterhead giving your position.

GOETZE GASKET & PACKING CO., INC.

32 ALLEN AVENUE, NEW BRUNSWICK, NEW JERSEY

<i>Boston</i>	<i>New York</i>	<i>Philadelphia</i>	<i>Pittsburgh</i>
<i>Cincinnati</i>	<i>Cleveland</i>	<i>Detroit</i>	<i>Chicago</i>
<i>Houston</i>	<i>San Francisco</i>	<i>Los Angeles</i>	<i>Montreal</i>
<i>New Orleans</i>	<i>St. Louis</i>	<i>Denver</i>	<i>Buffalo</i>



Frank R. Markley Appointed General Sales Manager of Sun Oil Company

APPOINTMENT of Frank R. Markley as General Sales Manager of Sun Oil Company was recently announced by Samuel B. Eckert, vice president in charge of marketing. Mr. Markley, formerly manager of the company's industrial products department, will serve as assistant to Mr. Eckert in the conduct of all sales activities.

Mr. Eckert also announced the appointment of

Maximilian H. Leister as general manager of Sun's motor products department. Mr. Leister, who has been acting general sales manager since April 1, 1942, will devote his full time to supervising the sale of all motor products and the operation of service stations and all advertising.

Ray H. Anders has been appointed to succeed Mr. Markley as manager of the industrial products department. Mr. Anders has been assistant manager of the department since September 15, 1944.

All three of the Sun Oil executives are veterans of company service who have worked their way up through the ranks.

F-M President's Cup To Milo C. Roy

MILO C. ROY, Manager of the Omaha Branch of Fairbanks, Morse & Co., was recently presented with the President's Cup by Colonel Robert H. Morse, the company's chief executive. It was thirteen years ago that Colonel Morse first presented a trophy to his branch house organization who had the largest volume of business in relation to its annual quota.



Milo C. Roy, Manager of the Omaha Branch, receives the President's Cup from Colonel Robert H. Morse.

For the first time since the inception of the contest over a decade ago, the famous trophy was won by the Omaha Branch of the company. Robert E. Hess topped the group of Omaha field engineers for the past year and consequently his name appeared on the cup alongside of that of Manager Roy.

In addition to Colonel Robert H. Morse, others from the Chicago Headquarters' office who attended the event were Robert H. Morse, Jr., Vice President and General Sales Manager, Charles H. Morse, III, Vice President in Charge of Research and Purchasing, and Henry J. Barbour, Manager of Sales Promotion and Public Relations.

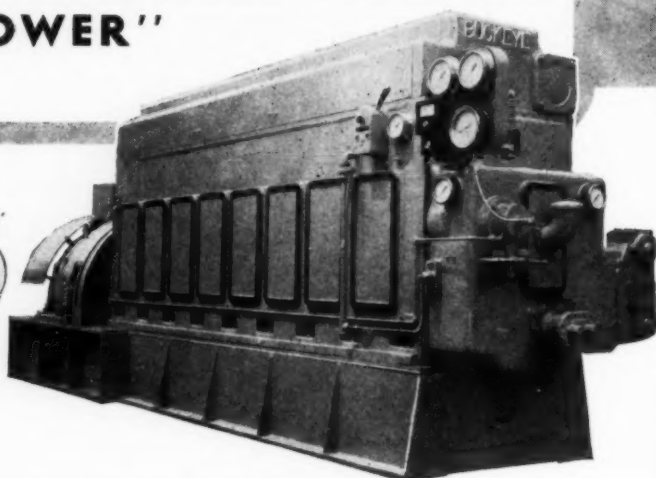
Fairbanks, Morse & Co. during the great World War devoted 100 per cent of its capacity directly or indirectly to war material production according to Colonel Morse. Diesel engines comprised the greater part of the firm's total business and many of the company's Opposed Piston Diesel engines were used by the United States Navy in submarines and other surface craft.

The company also awards a silver and bronze plaque for second and third places in sales achievement. This year the silver plaque was won by the Kansas City Branch and the bronze plaque by the Chicago Branch.

BUCKEYE DIESEL ENGINES

"A DEPENDABLE SOURCE OF POWER"

Marine or
Stationary



FOR NEW INSTALLATIONS
REPLACEMENTS OR CONVERSIONS

In thousands of marine and stationary installations, Buckeye Diesels are doing mighty good jobs—the kind of jobs their owners take pride in telling you about—the kind of job you want YOUR next Diesel engine to do for YOU.

The Buckeye catalog explains, in easily understandable detail, how a Buckeye Diesel combines precision construction with economical power and dependable operation. Your copy will be sent on request.

**Stationary and Marine
Propulsion (Direct
Reversing) Engines
150 - 900 H.P.**

**Marine Auxiliary
and Stationary
Generator Sets
100 - 600 KW**

Supercharged Ratings to 1440 H.P. and 1000 KW.

THE BUCKEYE MACHINE CO. — LIMA, OHIO

• ENGINE BUILDERS SINCE 1908 •

Continental Elects C. Wheeler Johnson

ESTABLISHMENT by Continental Motors Corp. of a general service and distributor sales department under the direction of C. Wheeler Johnson, newly elected vice-president, was recently announced by C. J. Reese, president.



C. Wheeler Johnson

The new department will assist distributors and dealers in improving their service to users of Continental engines throughout the country, he said. It will coordinate all service activities in connection with the company's large industrial customers as well as all service and sales promotion activities on industrial power units and transportation engines as they relate to distributors.

Mr. Johnson became associated with Continental a year ago, following 17 years with the Oliver Corp., manufacturer of farm equipment. During his last six years with Oliver he was manager of that company's Battle Creek plant. Since coming with Continental he has been on special assignments, chief of which has been working with the company's national distributor organization and formulating a program for rendering improved engine service and enlarging Continental's field sales organization.

Enterprise Strike Settled

ON March 18, the Enterprise Engine & Foundry Company plant reopened after being closed since October 29. 75% of the Enterprise employees returned to work following the signing of an agreement with representatives of the Grand Lodge of the International Association of Machinists. This places another important West Coast plant back in production and we understand that it has an appreciable backlog of engine orders for installation on both Coasts.

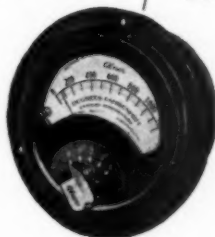


Big Diesel units equipped with

Alnor EXHAUST PYROMETERS

These engine-compressor units are working in the largest high-pressure cycling plant in the petroleum industry, and, as you will find with so many large engine installations, are equipped with Alnor Exhaust Pyrometers. Dependable temperature indications as a guide to efficient engine operation, maintenance, and adjustment are particularly important where dependable, continuous service is paramount. Alnor Exhaust Pyrometers are available in a complete range of types and sizes, to meet the needs of any type of engine. Write for special exhaust pyrometer bulletin with complete data.

TYPE FAX
PYROMETER



ILLINOIS TESTING LABORATORIES, INC.
420 NORTH LA SALLE STREET • CHICAGO 10, ILLINOIS

Consolidated Shipbuilding Expands—Re-elects William G. Wood

WILLIAM G. WOOD was reelected president of the Consolidated Shipbuilding Corporation at a recent meeting of the directors and stockholders held at New York. Mr. Wood announced after the meeting that Consolidated was broadening its facilities to include a fully equipped yard on Long Island Sound and, with that end in view, had purchased the real estate and buildings of the Robert Jacob shipyard at City Island, Bronx, New York. This

amalgamation unites the Consolidated which has been in business for sixty-five years and the Robert Jacob Corporation which has always been adjudged one of the fine yards for the building of pleasure craft. Consolidated was the winner of six Navy E's during World War II and has specialized in the manufacture of standard and custom built yachts.

Perfex Buys Government Building

THE Perfex Corporation has announced the

purchase of the manufacturing plant at 710 South Third Street, Milwaukee, which it operated during the war as its Optical Division. The building, which contains 63,000 square feet of floor space, will be used to increase production. Including 66,000 square feet now under long term lease, the corporation has a total of 314,000 square feet . . . nearly five times the plant area which comprised Perfex when it started in 1934.

Newly Appointed International Harvester Zone Manager

THE Industrial Power Division of the International Harvester Company has recently announced the appointment of George Schantz as Zone Manager for Zone 5, with headquarters at the International Harvester branch at Albany, N. Y. Mr. Schantz will work with the following International industrial power distributors: Vermont Road Equipment Company, Montpelier, Vt., and Milton Hale Machinery Company, Albany and Syracuse, N. Y.



George Schantz

Mr. Schantz has recently been honorably discharged from military service as Captain, U. S. Army. Prior to entering military service he was Industrial Representative for the International Harvester Company at the Aurora, Ill., branch.

Kurz and Root Appoints Sales Engineer

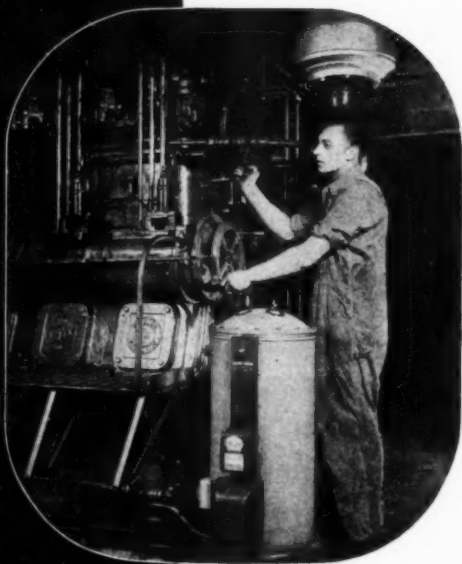
JESSE W. POMAZAL has been named sales engineer in charge of all sales activities of Kurz and Root Company. He has been with the company since September, 1945 in the engineering department, and prior to that time, was in the engineering department of Louis-Allis Company. An electrical engineer, he is a member of the American Institute of Electrical Engineers and the Engineers' Society of Milwaukee.

HONAN-CRANE OIL PURIFIERS reduce operating costs

In many thousands of installations, Honan-Crane Purifiers are paying substantial dividends in reduced maintenance and operating costs of power generating equipment.

We quote below a typical report on the satisfactory performance of Honan-Crane equipment, received from Frank Keast, assistant plant superintendent, Armstrong Paint Co., 1330 Kilbourn Ave., Chicago, Illinois:

"One type of equipment that has more than paid its freight around here is the Honan-Crane oil purifier. We have four of them hooked up with our large Diesel engines. Before the purifiers were on the job we had to change oil every 500 hours. Now we keep on using the same oil. We find that the operation of Honan-Crane units not only keeps dirt and grit out of the engine bearings and simplifies maintenance, but saves us a good 25% on our lubrication costs."



● The Armstrong plant produces 5 million gallons of paint and varnish annually; operates a 250 kva GE turbine generator and a 500 hp Fairbanks-Morse 2 cycle Diesel generator at 250 volts in one engine room; three 400 hp Chicago-Pneumatic 4 cycle Diesel generators at 2300 volts in a second engine room.

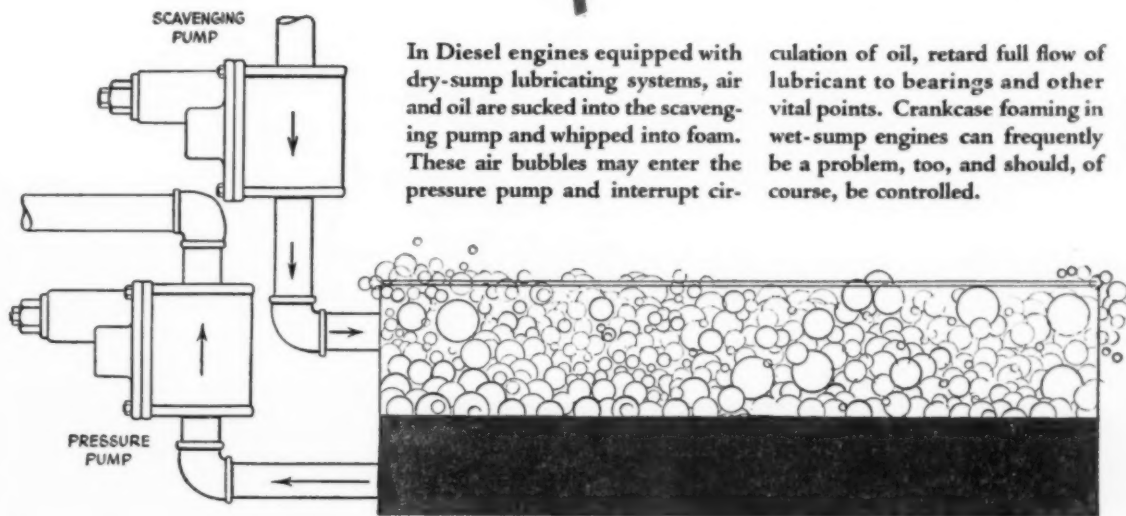
LET US HELP YOU ON
YOUR SPECIFIC PROBLEM

HONAN-CRANE CORP., 202 Indianapolis Ave., Lebanon, Indiana

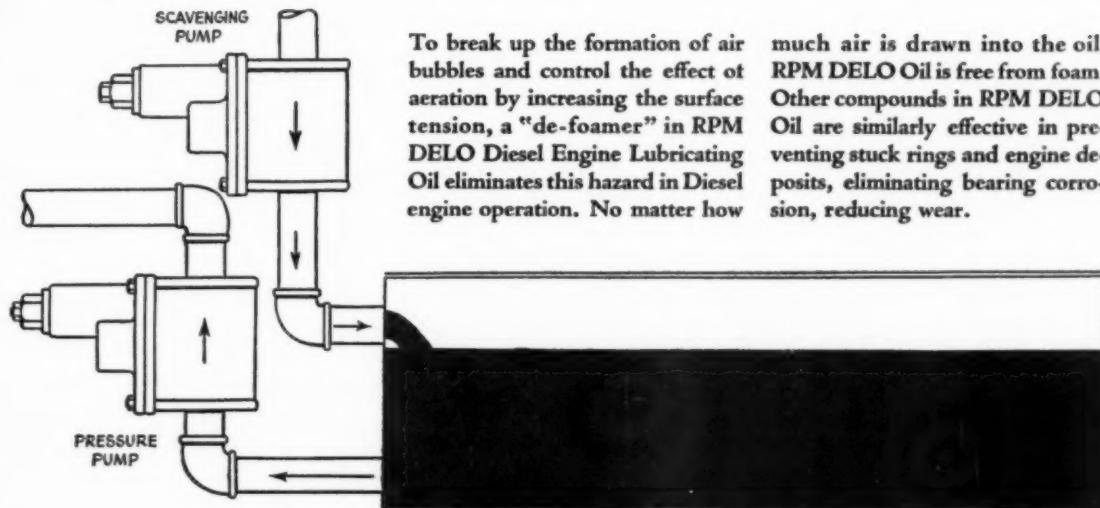
A Subsidiary of **HOUDAILLE-HERSHEY Corporation**

Diesel Engine **DANGER** points

AIR BUBBLES ENDANGER OIL CIRCULATION



RPM DELO OIL PREVENTS CRANKCASE FOAMING



To match the fine performance of RPM DELO OIL, use these equally efficient companion products from the same famous "RPM" line—RPM HEAVY DUTY MOTOR OIL—RPM COMPOUNDED MOTOR OIL—RPM GEAR OILS AND LUBRICANTS—RPM GREASES. For additional information or name of your distributor, write any of the companies below:

STANDARD OF CALIFORNIA • 225 Bush St., San Francisco 20, California
THE CALIFORNIA COMPANY • 17th and Stout Streets, Denver 1, Colorado
STANDARD OIL COMPANY OF TEXAS • El Paso, Texas
THE CALIFORNIA OIL COMPANY • 30 Rockefeller Plaza, New York 20



Houdaille-Hershey Appoints Houde Division Sales Manager

APPOINTMENT of Henry J. Helfrich as Divisional Sales Manager of the Houde Engineering Division of the Houdaille-Hershey Corporation was recently announced by Alfred C. Ryan, Assistant General Manager. A mechanical engineering graduate of Cornell University, Mr. Helfrich has served with the Houde Company since 1938 in the engineering and sales departments. He is a member of the Society of Automotive Engineers.

New Packed Compression Flange for Flexible Exhausts

DESIGNERS of new power installations seeking real engineering improvements in flexible exhaust and air intake pipes will be interested in the Penflex Packed Compression Flange for which a patent has just recently been applied.

This new flange is illustrated in a bulletin entitled "Penflex Flexible Pipes all Metal for Diesel Installations." It consists of a flange ring with an inset section that fits over the corruga-

tions on the outside of the flexible pipe. The fitting is packed in such a way that when it is drawn up tight on the hose it gives a strong, leak-proof joint.

Write Pennsylvania Flexible Metallic Tubing Co., 72nd and Powers Lane, Philadelphia 42, Pa. for Bulletin 71 and detailed specifications.

Caterpillar Announces Advancement of Kenneth F. Park



Kenneth F. Park

H. H. HOWARD, General Sales Manager of the Caterpillar Tractor Co., recently announced the appointment of Kenneth F. Park for the newly created post of engineering consultant for "Caterpillar's" three sales divisions which include the entire United States and Canada. Mr. Park, who formerly held the position of Sales Development Manager with the company, will specialize in the earth moving field in his new capacity.

Bulletin Describes Condensers and Coolers That Eliminate Water Supply Problems

AN important advance in heat exchangers is explained in a new bulletin which has just been prepared by The Griscom-Russell Co.

The first portion of the bulletin describes the Fin-Fan Exchanger, a "package-type" unit, jointly developed by The Griscom-Russell Co. and The Fluor Corporation, Ltd. More than twenty advantages of this exchanger for condensing and cooling fluids without the use of water are concisely outlined, and typical applications are listed to show the wide adaptability of the unit. Illustrations of installation show how these exchangers are adapted to large or small heat transfer requirements. The final portion of the bulletin describes the Griscom-



WHEN SERVICING MICHIANA OIL FILTERS

REPLACE
THE ELEMENTS
WITH
MICHIANA
ELEMENTS

Made in capacities from 163 h.p. to 3266 h.p. Element No. SA12900 is 6 1/2" diam. by 29 1/4" long.

Michiana Oil Filters made to new Navy standards from 100 to 2000 h.p. with identical elements. Element No. SA14900N is 7 1/4" diam. by 18" long.

INSURE "NEW" FILTER PERFORMANCE

You can always have the maximum oil filter performance and efficiency—equal to that of a new filter—if when servicing you always use MICHIANA replacement filter elements.

MICHIANA Oil Filters are protecting millions of horsepower of engines all over the world, daily proving their high dirt-absorbing and oil-cleaning efficiency. To insure this performance, be sure when servicing that MICHIANA Elements are used. MICHIANA PRODUCTS CORPORATION, Michigan City, Indiana.

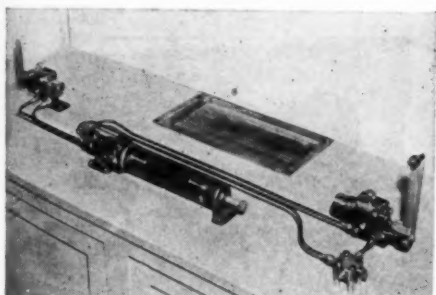
MICHIANA OIL FILTERS

Russell K-Fin Air-Cooled Section in detail, and explains the design and construction that provide a compact, durable and effective heat exchanger.

Engineers and process men who wish to avoid the expense, complication and problems of a water supply system for condensers or coolers will be particularly interested in this bulletin. Copies can be obtained by addressing The Griscom-Russell Co., 285 Madison Avenue, and asking for Bulletin 1230.

Ellinwood Hydraulic Control

ELLINWOOD Industries has developed a simple-to-install hydraulic remote control system of interest to Diesel and marine designers seeking remote controls for governors, throttles, clutches, valves of all sorts, as well as, emergency gear. Ellinwood engineers have used their background of marine and Diesel experience in developing this new control.

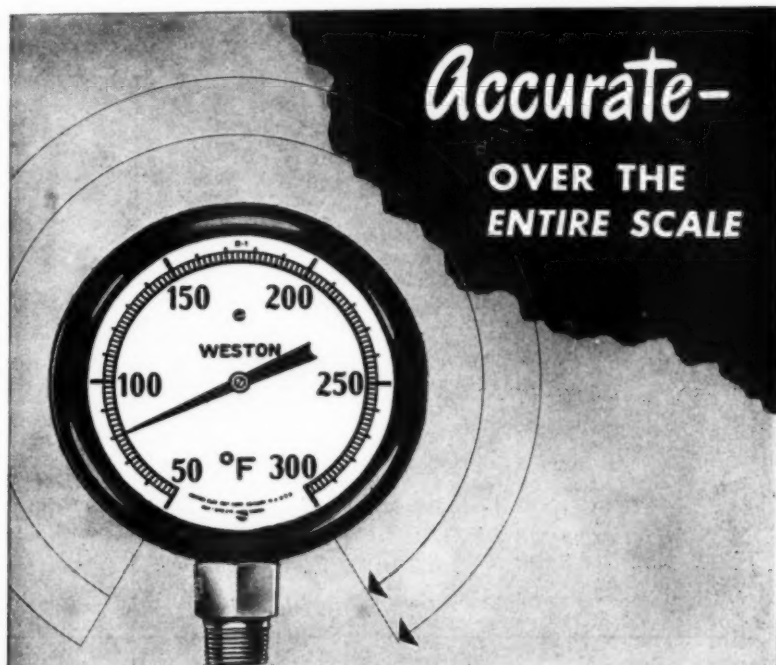


Ellinwood Hydraulic Control set up to operate louvers.

The control consists of a light but sturdy "master" control unit which transfers power and motion through one quarter inch fluid-filled tubing to a "slave" or actuating unit, which in turn is coupled directly to the mechanism requiring actuation. The fluid system is kept under a constant static pressure by a compensator unit which takes care of slight volumetric changes of the fluid due to temperature variances. These changes are inevitable in any marine installation.

Five hundred inch pounds torque can be applied to the "slave" through the "master" control with the two units being as much as 150 feet apart. Once synchronized, the units will operate together perfectly through an arc of 60 degrees.

Acting on the expressed interest of the marine, oil, and Diesel industries, the company will soon have on the market five other hydraulic controls designed to meet heavier load requirements and specialized industrial needs. For full particulars write Ellinwood Industries, Inc., 160 West Slauson Ave., Los Angeles 3, Calif.



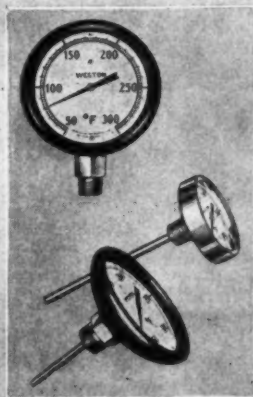
**Accurate-
OVER THE
ENTIRE SCALE**

Weston *All Metal* thermometers

Engineered and constructed with typical WESTON precision, these rugged thermometers are dependably accurate over the entire scale. Moreover in their unique all metal construction, the bi-metal principle has been developed to assure the retention of this high accuracy over long periods of time . . . despite shock or vibration, or subjection to temporary over temperatures.

Equally important . . . you can read a WESTON accurately and easily, even in subnormal light, in out-of-the-way corners, or on equipment or pipelines above or below eye level.

WESTON gauge-type, all-metal thermometers are available in types, sizes and stem lengths for equipment mounting, as well as for industrial and processing needs. Full details, in bulletin form, available on request . . . Weston Electrical Instrument Corporation, 617 Frelinghuysen Avenue, Newark 5, New Jersey.

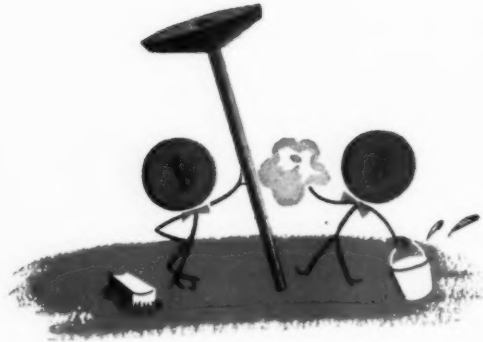


Weston

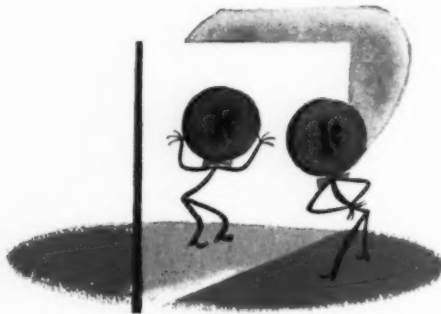
All Metal **THERMOMETERS**



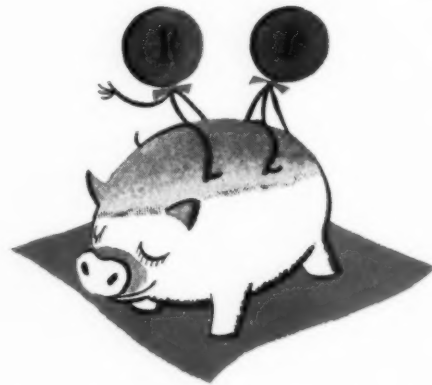
The very best oil takes less than 2¢ out of every operating-cost dollar... but look what 2¢ can do!



1. Keep pistons, valves, rings and other vital parts cleaner by removing hard carbon.



2. Keep a tough, heat-absorbing, pressure-absorbing film between moving parts.*



3. — and so give you substantial savings* in down-time, maintenance and repair costs!

***Prove it in your own equipment**



THE LOW-MAINTENANCE OIL

Macmillan Ring-Free motor oil IS different. Because it IS a better oil, we invite you to test it against any other brand. We'll gladly help you arrange a dollars-and-cents test in your own equipment. Write, wire or phone the nearest Macmillan office. MACMILLAN PETROLEUM CORPORATION, 50 W. 50th St., New York 20 • 624 S. Michigan Avenue, Chicago 5 • 530 W. Sixth St., Los Angeles 14.

HIGH, HIGH FILM STRENGTH! LOW, LOW ENGINE DEPOSITS! CLEANS AS IT LUBRICATES!

Here it is



MUSHROOM TYPE

Zero-Lash

Registered U. S. Patent Office

HYDRAULIC VALVE LIFTERS

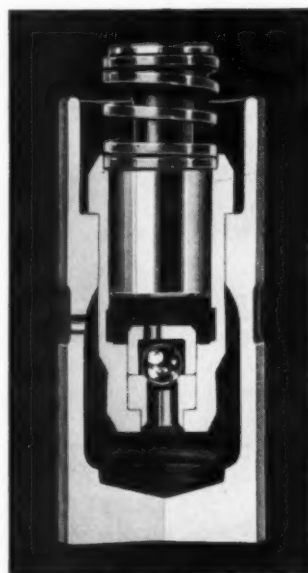
provide

- ★ Accurate valve timing and perfect seating at all engine speeds and temperatures.
- ★ Longer life for valves and seats.
- ★ Freedom from adjustment for the life of the engine.
- ★ Silent valve train operation.

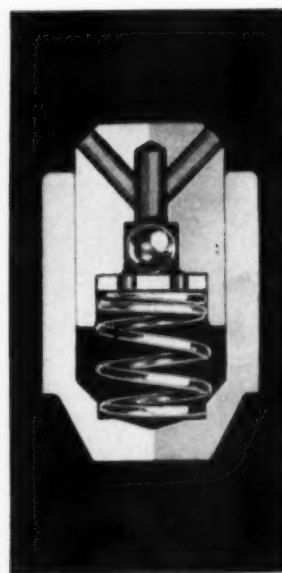
The *Zero-Lash* Hydraulic Valve Lifter is a simple, positive-action device, which automatically adjusts its own length during each revolution of the camshaft to compensate for expansion or contraction in the valve train. It is available in three basic types—mushroom, barrel, and stub—which are adaptable to all internal combustion engines, gasoline or Diesel.

In addition to improved engine performance, longer service life for valve train parts, and silent operation, *Zero-Lash* Hydraulic Valve Lifters eliminate the need for adjustment, and permit the simplest and most advantageous engine design.

Eaton engineers will be glad to discuss the application of *Zero-Lash* Hydraulic Valve Lifters to engines now in design.



BARREL TYPE



STUB TYPE

© 1946, EATON MFG. CO.

Illustrated literature covering the design and operation of Zero-Lash Hydraulic Valve Lifters, including reports of outstanding service records, will be furnished upon request.

EATON

MANUFACTURING COMPANY

WILCOX-RICH DIVISION

9771 French Road • Detroit 13, Michigan

Coast Guard to Occupy Large Space at Marine Exposition

MORE than 125 concerns are already included in the list of exhibitors who have contracted for space at the National Marine Exposition which will be sponsored by The Propeller Club of the United States at Grand Central Palace, in New York, May 20-25.

Roger E. Montgomery, General Manager of the Exposition, has announced that one of the most interesting exhibits will be that of the United

States Coast Guard, which will occupy a large space on the main floor. In signing the contract for this space, Rear Admiral Edward Smith, District Coast Guard Officer, stated that the Coast Guard will portray its activities connected with safety at sea, aids to navigation and other services directly concerned with merchant shipping.

The National Marine Exposition will present a panorama of the American marine industry in which every branch of maritime activity will

be represented. Leading American steamship companies, shipbuilding and repair concerns, manufacturers of every kind of marine equipment, dealers in marine supplies and purveyors of services will take advantage of this opportunity to display their products and demonstrate the part they are prepared to play in the operation of the new American Merchant Marine.

Nordberg Elects F. H. Kilberry

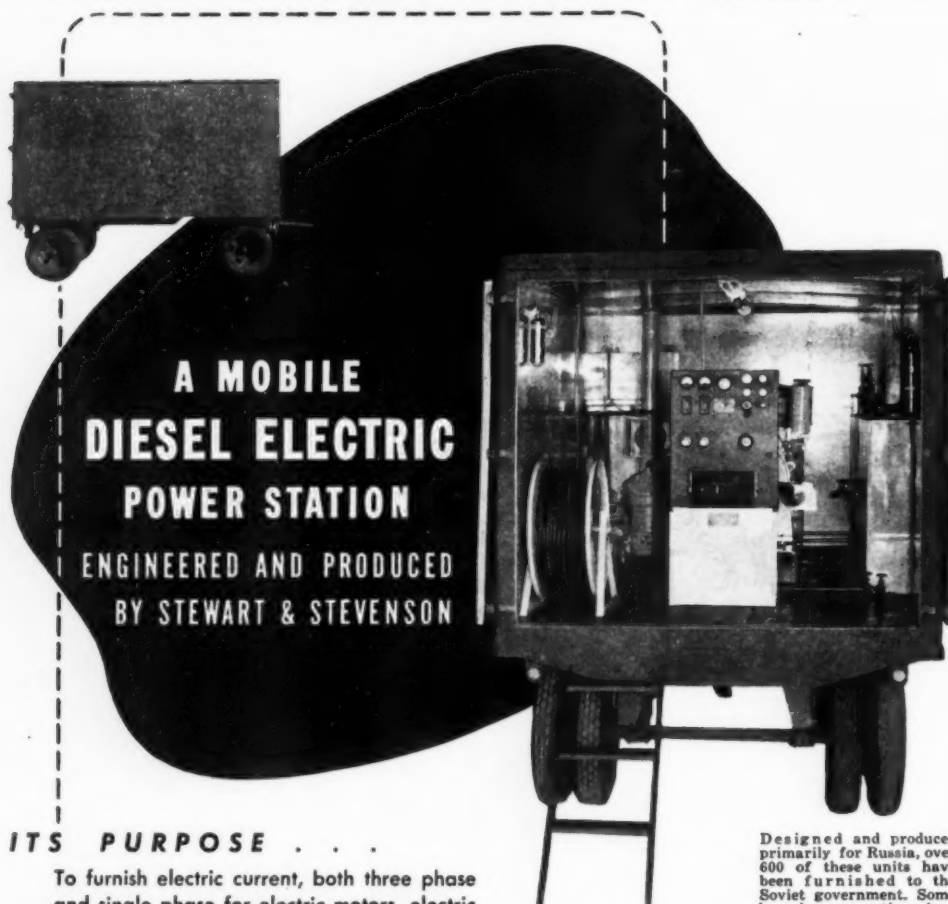
NORDBERG Manufacturing Company, through its President, Robert E. Friend recently announced the election of F. H. Kilberry to the position of Executive Vice President and director, to fill the vacancy created by the resignation of C. E. Stryker, who has been associated with the company since 1940 in the capacity of Vice President and Assistant to the President. Mr. Stryker has accepted the position of President of the Adel Precision Products Corp., of Burbank, California, and will assume his new position on March 1, 1946.



F. H. Kilberry

F. H. Kilberry has been identified with capital goods industries since 1920. In 1928 he became associated with Atlas Imperial Diesel Engine Company of Oakland, California. He was appointed Assistant to the President and a director of that company in June 1929, and in 1930 was appointed General Manager. In 1932 he was elected Vice President and General Manager, and served in that capacity until his election to the presidency in 1938.

Mr. Kilberry resigned from the presidency of Atlas Diesel in May 1945, and has since been associated with the Nordberg Manufacturing Company.



ITS PURPOSE . . .

To furnish electric current, both three phase and single phase for electric motors, electric lights and all other types of electric appliances. The Power Station is furnished complete and mounted in a four wheel van type trailer. Easily transported from place to place. It carries all necessary equipment, tools, spare parts and accessories for proper operation.

ITS USE . . .

For temporary power where main line electrical facilities have been destroyed or damaged and for operating in parallel as a booster plant with overloaded power plants. It is equally suitable for a continuous heavy duty power plant for 24 hour service.

ITS FUEL . . .

It burns Nos. 1, 2 and Diesel fuel, kerosene, or lubricating oil. Anyone of these may be changed without making any adjustments to the fuel injection system. For further information and prices of this revolutionary engineered Power Station, write

Designed and produced primarily for Russia, over 600 of these units have been furnished to the Soviet government. Some have been operating since 1942, producing dependable power for rehabilitating the war devastated areas of the Soviet Union.



4516 Harrisburg Blvd. • Houston 3

Anywhere

SERVICE • PARTS
Anytime

NEW IMPROVED SUPER-LUBRICANT

FOR TOUGHEST LUBRICATION JOBS
IN CARS, TRUCKS, TRACTORS AND STATIONARY ENGINES



- Resists Formation of Sludge; Lacquer, Carbon
- Removes Hard Carbon
- Stronger Protective Film
- Non-Corrosive—Safe
- Keeps Piston Rings Free
- Adds Power, Saves Fuel, Saves Wear and Shut-down Time

Accepted by Leading Engine Manufacturers as a Superior Lubricant.

LION *Naturalube* **D.H.D. OIL**

Naturalube D.H.D. is made from a rare and basically different crude oil which imparts to the finished product a stronger protective film... greater adhesiveness and penetrativeness... and ability to remove hard carbon deposits. By special processing, Naturalube D.H.D. is reinforced against the deteriorating effects of extreme heat and oxidation. Because of D.H.D.'s resistance to formation of deposits of sludge and lacquer, engines are clean-

er; rings and valves operate freely for longer periods; filters, screens and oil lines function normally. There is no hard-carbon scuffing; general engine performance is greatly improved; operating and maintenance costs are lower; shut-down time is minimized. D.H.D. is non-corrosive—safe. It saves wear, adds power and saves fuel. Try D.H.D.—Your money back if you don't believe it to be the best oil you have ever used.

**For normal service where D.H.D. is not required, use Naturalube Motor Oil (not so heavily reinforced.)*

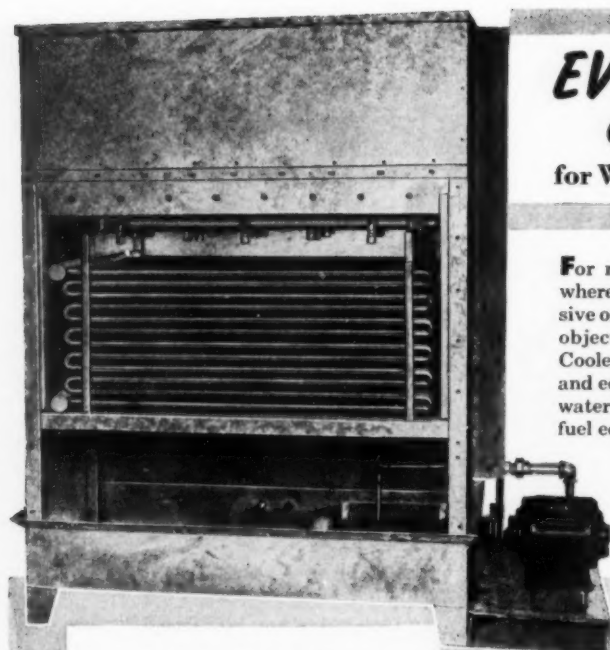
POSITIVE MONEY-BACK GUARANTEE

For further information about Naturalube Oils, see the local Naturalube Distributor or write direct to Lion Oil Company, El Dorado, Arkansas.



LION OIL COMPANY

EL DORADO, ARKANSAS



EVAPORATIVE COOLERS

for Water Saving Economy

For many diesel engine installations, where cooling water is scarce or expensive or the installation of a cooling tower objectionable, usAIRco Evaporative Coolers provide a highly satisfactory and economical means of cooling jacket water or lubricating oil. You get greater fuel economy, because water and lubricating oil are always at same temperature. usAIRco Evaporative Coolers are space savers, too—simplifying piping systems.

**United States
Air Conditioning
Corporation**

Minneapolis 14, Minnesota



OTHER PRODUCTS

COOLING & HEATING COILS • AIR WASHERS
BLOWERS • FANS • UNIT HEATERS
AIR CONDITIONING UNITS

FACTORY REPRESENTATIVES IN PRINCIPAL CITIES

Fawick Airflex Opens Dallas Office

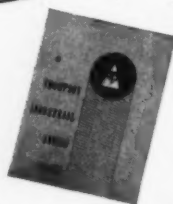
THE Fawick Airflex Company recently opened a Sales and Service agency in Dallas under the management of John W. Eakin.



John W. Eakin

Mr. Eakin, who formerly headed the clutch service division of the Fawick plant, is a graduate of the University of Oklahoma Engineering School. His present business address is 2509 Commerce St., Dallas, Texas.

BRING YOUR Valve Problems TO THOMPSON



SEND FOR THIS VALVE BOOKLET!

Here's comprehensive on-the-job information helpful to engineers and mechanics alike in overcoming common valve problems. Reviews, in non-technical language, such subjects as Valve Clearances... Valve Servicing... Valve Seat Installation... Grinding Techniques... Seat Insert Removal... Valve Guide Installation. Discusses procedures and gives practical tips on how to keep your engines running longer, more efficiently, without overhaul. Your copy is free—and will be sent promptly. Send for it today!

WHETHER you are encountering costly valve problems with your present engines... or are considering the manufacture of new engine designs... Thompson's forty years of experience in this field are available to help you. Thompson engineers are constantly working with engine operators and manufacturers alike in designing valves, seats and guides to meet specific needs. They will be glad to answer your requests for further information on the valve designs best adapted to your requirements. Write, outlining your needs.



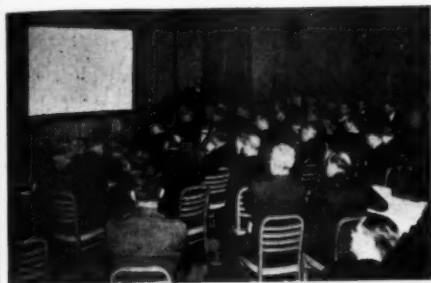
Thompson Products, Inc.

WEST COAST PLANT • BELL, CALIFORNIA



Detroit Diesel Prepares For Export Market

COMPREHENSIVE coverage of the world export market figures actively in merchandising plans of the Detroit Diesel Engine Division of General Motors Corporation according to V. C. Genn, General Sales Manager, and Duncan Lamont, Manager of Overseas Sales. Detroit Diesel recently completed a five-day "refresher course" for the men who will be responsible for the sales and servicing of the GM Series 71 Diesel engines abroad.



V. C. Genn, General Sales Manager, and Glen Shoemaker, Chief Engineer, conduct a meeting of General Motors overseas men.

Talks were given by Detroit Diesel officials not only on GM Diesel features and varied applications but also on distribution and potential markets. Such applications as pleasure and work boats, trucks and coaches, tractors, oil fields, lumbering, cotton ginning and other industrial uses where motive power is needed for shovels, hoists, dumpers and road-building machinery were stressed. Three days were devoted to sales and two days to engineering and service.

Exclusive of the United States, Canada and Alaska, the sales and service of the GM Series 71 engine will be handled entirely by the Overseas Division of General Motors under the direction of Earl E. Eby, Sales Manager of Industrial and Power Equipment. GM Overseas representatives from the following countries attended the meeting: Sweden, Denmark, Belgium, France, India, Australia, Java, New Zealand, Brazil, Argentina, Mexico, Uruguay, Peru, Venezuela, Cuba, Chile and South Africa.

Vortex Announces New Eastern Headquarters

TO provide more convenient facilities for serving their customers throughout the Central and Eastern states, and users of engines and compressors equipped with Vortex Oil-Bath Air Cleaners, Vortex Company has moved its Eastern headquarters from Detroit to 405 Immanuel Building, 2326 South Michigan Avenue,

Chicago 16, Illinois, phone number Calumet 8620. Both O. A. Lohrke and his associate, N. B. Hedden, eastern representatives of Vortex, will make their headquarters in this new Chicago office.

Nalco Announces New Scale Preventative

THE National Aluminate Corporation of Chicago has announced a new scale and algae preventative which can be used in Diesel cooling systems. Nalco No. 8 is produced in briquet

form under high pressure and is allowed to dissolve slowly in the cooling system of the engine. This is accomplished by the use of bypass feeders which are furnished by the company, if they are needed. The action of Nalco No. 8 is to retard or prevent the crystal growth of scale forming minerals, thereby destroying their ability to interlace or interlock together and form scale. Further information concerning this product may be had upon request from the National Aluminate Corporation, 6216 W. 66th Place, Chicago, Illinois.

**ENGINEERED
AND BUILT**
for Big Jobs

Fulton Diesels are the products of engineering skill accumulated over a period of 94 years of successful heavy machinery design — our shops are amply equipped to finish the heaviest of parts to close limits. Every detail of material and workmanship that enters into the Fulton Diesel is aimed at long life and outstanding economy in operation and maintenance—sound engines through and through — that is why

Fulton Diesels are specified for long range power projects.

1852 Successful Engine
Builders for 94 Years 1946



FULTON IRON WORKS CO.
• ST. LOUIS • MISSOURI •

Sterling Elects Comdr. Russell J. Roberts

THE Sterling Engine Company has announced that Commander Russell J. Roberts, U. S. Coast Guard, has been elected as Assistant to the President, to fill the vacancy created by Edward M. O'Connor who retired on January 1st, after serving 29 years with the company. Commander Roberts has resigned his commission with the Coast Guard to accept this appointment.

Commander Roberts was graduated from the United States Coast Guard Academy in 1930. In 1935, after varied assignments at sea, he became Ship Superintendent in Charge of Construction of the Coast Guard Cutters, *Hamilton* and *Spencer* at the New York Navy Yard.

Commander Roberts' long experience in Ma-

rine Engineering, Boat Maintenance and Design, will make available his engineering knowledge to Sterling customers, boat builders and naval architects on planning new projects.



Commander Russell J. Roberts

Gulf Engineers Solve Problem Of Foaming Lube Oil

THE Gulf Oil Corporation has announced that its engineers have found the long-sought answer to foaming lubricating oil. The answer lies in an efficient method of breaking the air bubbles in the oil which are formed by the constant churning of lubricants in modern high-speed engines, especially in gear boxes and bearings of such equipment. Foaming oil is dangerous oil because the tiny bubbles which are formed render pumps relatively ineffective and seriously endanger the security of protective oil film on moving parts. The new agent introduced by Gulf is not of a mechanical nature, it is an additive which simply and efficiently reduces the surface tension of the oil thus allowing the air bubbles to break quickly on reaching the surface. This anti-foam agent

On Large Engines or Small - It Damps Torsional Vibration *Efficiently*



The larger of these two dampers was designed for a locomotive diesel of 660 horsepower — the smaller for a 6 cylinder automobile engine.

Houdaille Viscous Torsional Vibration Dampers have already been designed for a score or more internal combustion engines in both gasoline and diesel fields. In every case extensive tests have demonstrated that BOTH major and minor critical orders of vibration are damped more efficiently than with any other service.

The damper employs the new Silicone fluid so that its efficiency is unaffected by temperature variations. It is extremely simple since there are only two essential parts...the damper mass or flywheel and the two-piece welded housing. It requires no servicing and will operate efficiently for the life of the engine.

Houdaille engineers will be glad to design a Viscous Torsional Vibration Damper to meet the individual characteristics of any engine, large or small.

An exclusive development of
Houde Engineering Division —
patents pending.

HOUDAILLE-HERSHEY CORPORATION
Makers of Hydraulic Controls
BUFFALO 11, NEW YORK
*Pronounced Hoo-dy

WHETHER
YOU BUILD
OR OPERATE

DIESELS

It will pay you to specify Sealed Power...

PISTONS



SLEEVES



PISTON



RINGS

FOR *original equipment*, leading Diesel engine builders in truck, tractor, marine and heavy construction equipment fields have long preferred Sealed Power products.

For *replacement*, America's leading distributors are now able to supply Sealed Power motor parts.

Whether you build Diesel engines or operate Diesel engines, Sealed Power offers you the products of the perfect combination—the industry's finest laboratories, a top-flight engineering staff, and production facilities and craftsmanship second to none.



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CORPORATION**

Muskegon, Michigan • Stratford, Ontario

Keep Your War Bonds—Get \$4 for \$3

SEALED POWER PISTON RINGS

PISTONS—CYLINDER SLEEVES



U.S. INSTRUMENTS Tell The Truth
USG

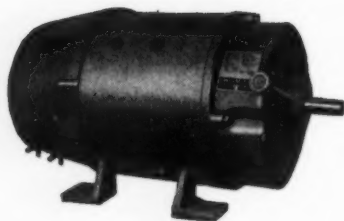
PRESSURE, TEMPERATURE, FLOW, ELECTRICAL
AND LEVEL MEASURING INSTRUMENTS

UNITED STATES GAUGE

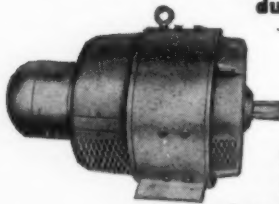
DIVISION OF AMERICAN MACHINE AND METALS, INC.
SELLERSVILLE, PENNSYLVANIA (13)

6 out of 10
manufacturers of
original equipment
specify U.S.G.

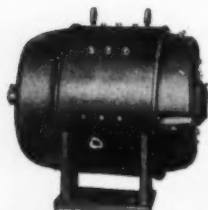
GENERATORS *AC and DC*



Well-known for their rugged design, efficient performance, long life and minimum maintenance, whether powered by electric, gasoline, or Diesel equipment. Backed by over 1/2 century of manufacturing and designing experience, Kurz and Root generators are now serving industries throughout the world.



Illustrated are AC generators, only 2 of the many different types developed and designed to fit specific needs and applications. (upper left) two-bearing self-excited type; (lower right) two-bearing, direct connected exciter type.



DC generator (left) two-bearing, self-excited type. Can also be

furnished with direct connected exciter. Both AC and DC generators can be furnished in the single bearing, flange-mounted type for special mounting requirements. Ball bearing construction is used throughout. Complete data upon request.

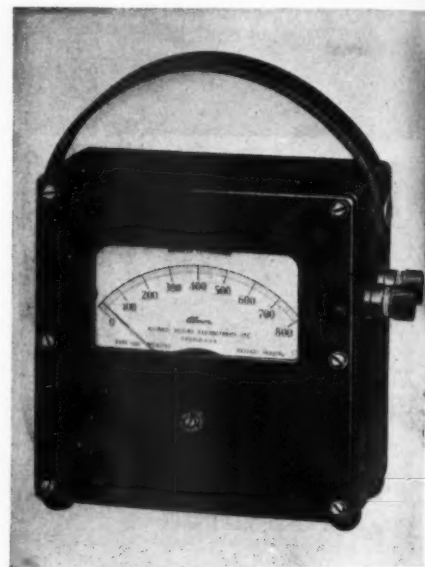


KURZ and ROOT Company
APPLETON - WISCONSIN
.....and 100 motors and motor generator sets

does not affect the lubricating quality of the oil. Its application to the Diesel field should meet with great success especially in cases of high speed operation where foaming oil is most likely to be encountered.

Alnor Type 1500 Portable Pyrometer

ALNOR Type 1500 is a compact, lightweight portable pyrometer mounted in a magnetically shielded metal case, providing accurate temperature readings in shop and general industrial use as well as in the laboratory.



The pyrometer movement is the Alnor double air gap type, with Alnico magnet. The case is heavy gauge sheet steel, providing magnetic shielding, so that Type 1500 may be used on steel top table, near other magnetic instruments, or in strong alternating fields without suffering the unpredictable errors experienced with unshielded pyrometers. Type 1500 is available as a single circuit pyrometer with a choice of ten scale ranges, 0-400 to 0-3000 F, and as a double or triple range instrument built to order with scales as specified. Centigrade scales can be furnished. Descriptive bulletin will be sent upon request to Illinois Testing Laboratories, Inc., 420 N. LaSalle Street, Chicago 10, Illinois.

Frontier Industries Buys Manzel Brothers Company

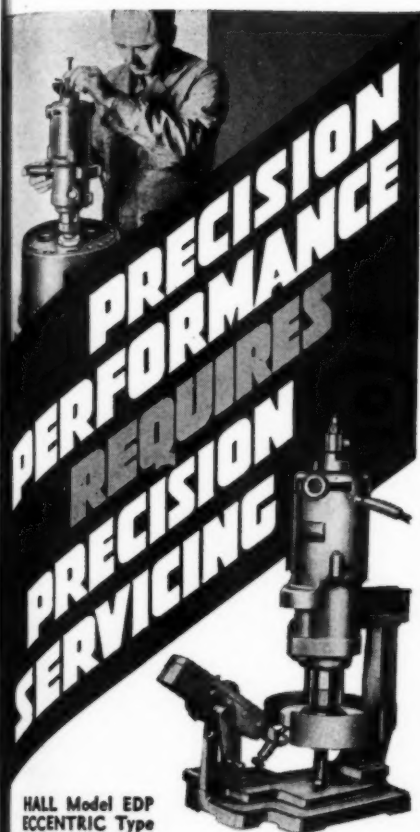
PURCHASE of the 48-year-old firm of Manzel Brothers Company, by the newly-formed Frontier Industries, Inc., was recently announced by Ralph F. Peo, president. No change will be made in the Manzel company's name and its business and organization of workers will be kept virtually intact. The new board

HALL Model
ECCENTRIC
Valve Seat
on Diamond
Stand

Precision
locomotive
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valves than
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TO



HALL Model EDP
ECCENTRIC Type
Valve Seat Grinder
on Diamond Dresser
Stand

Precision performance of stationary, locomotive or marine diesel engines requires finer precision in the servicing of valves than any other type of engine . . . That's why HALL makes a Valve Seat Grinder especially for diesels . . . By its ECCENTRIC grinding principle it removes only enough metal to true up the seat, leaving the remainder of valuable surface of the seat, hardened by heat and the constant pounding of the valve . . . That's why, by the HALL method, seats are serviced rapidly and need re-servicing less often, giving thousands of extra miles of precision performance before re-servicing is again needed.

Write today for complete information on the HALL Model EDP Seat Grinder and the HALL Wet Type Valve Refacer.

THE HALL MFG. COMPANY
TOLEDO 7, OHIO

HALL

of directors will consist of: Herman J. Manzel, Ralph F. Peo, Samuel D. Lunt, George F. Phillips and Karr Parker.

"Our intention is not only to expand the sales and production of long-established Manzel products but to develop additional business in machined parts or new products," said Mr. Peo.

The Manzel company is known internationally for its force feed lubricators used on steam and Diesel engines, pumps, air and ammonia compressors, and other heavy machinery. Nearly all of the Diesel Victory ships and steam Liberty ships were Manzel-equipped during the war.

Acquisition of the Manzel plant is the first step in the program of Frontier Industries, Inc., which plans either to purchase going businesses or to provide management experience, engineering services and supervisory personnel for small business firms.

New Type Gapless Piston Ring Announced

THE Auto-Diesel Piston Ring Company announces a new type piston ring. This ring consists of two identical parts that interlock when completely assembled and forms a ring without a gap. There is positive seal with no chance of blow by.



The Auto-Diesel Helicam Gapless Piston Ring is adapted for carrying oil within itself if desired—it can also be used as an oil ring while retaining its expanding features. It can also be made a contracting ring for sealing shafts, bearings, for replacing packings, etc. and many other applications.

It can be used as original equipment and replacement for Diesel units of all types—stationary and mobile units and hydraulic and pneumatic operated industrial equipment. For descriptive circular, write The Auto-Diesel Piston Ring Company, 3283 Superior Avenue, Cleveland 14, Ohio.

RITCO

DIESEL ENGINE STUDS



SUPER QUALITY PRECISION-CUT THREADS

RITCO Diesel Engine Bolts and Studs are right in material and precise in dimensions. Their finish and physical properties meet the highest standards of Diesel construction.

Remember RITCO for

SPECIAL BOLTS, NUTS AND STUDS
DROP FORGING • HEAT TREATING
DIESEL ENGINE BOLTS and STUDS
MILLED BODY BOLTS

Let us quote on your specifications.
Catalog on request.

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LUBRICATORS

A modern lubricator for modern service on Diesel, gas, steam engines and compressors. Supplies dependable cylinder lubrication in metered quantities reducing friction and wear. Capacities: 2 to 24 pt. and 1 to 16 feeds. New catalog on request.



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DIESEL POWER

**45,000 Horsepower
FOR YOUR SELECTION
Modern—Immediate Delivery
COMPLETE PLANTS**

Engine Generator Sets
1800 H.P.—1500 KVA Capacity and
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"Power Equipment"

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Business Established 1896

**CRACKED HEADS WELDED
• ENGINES REPAIRED**

**Satisfaction VALVE SEATS
Guaranteed HARD SURFACED**

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AN ENGINEERING SERVICE

117 Clifton Pl.
Brooklyn,
New York

Socony-Vac Announces Changes In Eastern Marketing Division

GEORGE WALKER, division manager, south-eastern division, for the Socony-Vacuum Oil Company, Inc., has been transferred from Baltimore, Md., to New York, where he will become head of the National Planned Distribution Survey Department.

George D. McDaniel, for the past 15 months district sales manager, Baltimore, Md., will succeed Mr. Walker as southeastern division manager.

Other changes in Socony-Vacuum's eastern marketing division are:

W. H. Stanford from district sales manager, Springfield, Mass., to Baltimore to succeed Mr. McDaniel as district manager.

W. R. Johnston, Lieut., (USNR) who has returned to Socony-Vacuum after being on military leave since January 1943, to succeed Mr. Stanford as Springfield district sales manager.

Diesels Cut Housing Shortage

SOUTH CAROLINA pine is easy meat for the Diesel-driven saws of the McDaniel and Harris mills. Both operators have installed General Motor Diesels in the interests of economy and dependability for their sub-contracting job with the Kingtree Lumber & Manufacturing Company of Walterboro, South Carolina. Their present figures show that the production of 2,200 board feet of edged lumber per hour costs them approximately 35 cents in fuel. This economical operation speaks well for the Diesels which have been operating at a profit for five years.



PETROMETER

FOR TANK GAUGING EQUIPMENT FOR
DAY TANKS & CLEAN OIL STORAGE
PETROMETER CORPORATION
1 STAR SQUARE, LONG ISLAND CITY, N. Y.

FOR SALE

40 KVA, 60 HP Venn Severin Generating Set. Used three years—selling property and must dispose of complete unit. Cost new \$6000. Sacrifice selling price: \$1600.

EVEREADY ELECTRIC & SUPPLY CO.
805 Housatonic Ave.
BRIDGEPORT CONNECTICUT

More Compression with the AUTO-DIESEL Helicam GAPLESS PISTON RING...



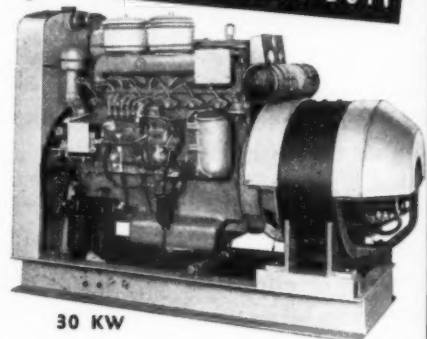
Semi-Assembled

Holds high compression because of accurate finish, correct shape and Helicam GAPLESS feature. Two IDENTICAL interlocking parts form a ring WITHOUT A GAP, providing a tight seal that prevents blow by. AUTO-DIESEL Helicam GAPLESS Piston Rings have the tension, flatness, circularity and close dimensional limits necessary for maximum performance. Made in sizes from 1" to 36" for original equipment and replacement in Diesel units of all types, and for pneumatic and hydraulic equipment. Can also be used as oil rings... as contracting rings for sealing shafts and bearings... or for replacing packings.

THE AUTO-DIESEL PISTON RING CO.
3151 SUPERIOR AVE. CLEVELAND 14, OHIO

QUALITY RINGS SINCE 1921

ELECTRICITY for STAND-BY SERVICE OR CONTINUOUS DUTY



30 KW

Choose the correct Electric Plant for your needs from the "U.S." complete line. For emergency stand-by service, continuous duty, or portable uses. Gasoline or Diesel—AC or DC. Write for information.

U. S. MOTORS CORP.

542 Nebraska Street
OSHKOSH, WISCONSIN

U.S. DIESEL
ELECTRIC PLANTS

Wausau Appoints Jack Mohr



Jack Mohr

THE Wausau Motor Parts Company announces the appointment of Jack Mohr as Divisional Sales Manager for the Wausau Midwestern Division, covering Wisconsin, Illinois, Minnesota, Northern Michigan, North Dakota and South Dakota. Mr. Mohr has spent his entire business life in the automotive field and was formerly with A. P. Parts Company, the Raybestos Company, and the Hastings Manufacturing Company. Mr. Mohr will headquarter at Wausau's Chicago warehouse, 2620 South Michigan Avenue.

Booklet On Steam Detergent Cleaning Methods

OF increasing interest to Diesel engine operators, engineers and others responsible for machinery and equipment maintenance cleaning are the savings in time, money and effort being effected by steam detergent cleaning methods. A booklet on this subject has been published by Oakite Products, Inc. and is available free upon request. Described in this booklet are many applications of steam detergent cleaning for (1) cleaning machinery equipment and parts for subsequent repair and overhaul, (2) preparing equipment surfaces for repainting or refinishing, (3) cleaning equipment too large for tank immersion, or where suitable tanks are not available, (4) paint stripping. Emphasis is placed on steam detergent cleaning as a simple, fast method for safely removing grease, oil, dirt, sand and other deposits from all types of equipment through the combination of mechanical force, controlled heat and effective detergent action of recommended materials. Savings of nearly 50% of former costs and over 90% of time and effort are reported on some cleaning operations using this modern method. Write to Oakite Products, Inc., 22D Thames Street, New York 6, N. Y. for a free copy of their booklet on "Steam Detergent Cleaning."

New Liquid Repair Seal

A NEW liquid repair seal, known as Everman's Likwid Repair, is announced to the trade by its manufacturers, the Everman Products Company. This product is the first of a new and complete line of improved motor repair and cooling system service materials, being manufactured and offered to the trade by this recently organized company.

Everman's Likwid Repair, as well as other items manufactured by the Everman Products Com-

pany, is the direct result of new developments in chemical and metallurgical research made during the war, plus years of practical experience in the field. The manufacturers state that exhaustive tests made have shown that Everman's Likwid Repair and the new metal alloys used, have great capacity for sealing heat or freeze cracks and ability to withstand and absorb vibration. For further information on Everman's Likwid Repair, write Everman Products Company, 2326 So. Michigan Ave., Chicago 16, Illinois.

Send for Your **FREE** Copy

K & W NEW COMPLETE LINE CATALOG



LEARN THE MECHANICAL METHOD PRINCIPLES THAT SAVE IMPORTANT TIME AND MONEY ON CRACKED ENGINE REPAIRS!

If you want to be up to date on engine repairs, you'll want your copy of Kerkling & Company's new K & W catalog — and you'll want it fast!

Nationally Advertised

There's a big special section with illustrations and diagrams devoted exclusively to the "how" and "why" of the patented K & W Mechanical Method — the efficient, low cost way for repairing cracked engine heads and blocks.

Used extensively by leading engine rebuilders, fleet operators, railroads and military repair centers, the K & W Mechanical Method offers an amazing opportunity for slashing costs on cracked engine repairs.

Don't wait — get your K & W catalog now — it's free!



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Diesels described
PROFUSELY ILLUSTRATED

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A FEW
COPIES
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Volume 10

THOUSANDS BUY THE DIESEL ENGINE CATALOG EACH YEAR — THOUSANDS MORE WILL WANT THIS TENTH EDITION BECAUSE THEY WILL NEED IT MORE THAN EVER, AND IT IS THE ONLY BOOK OF ITS KIND PUBLISHED. MAKE SURE YOU HAVE UP-TO-THE-MINUTE INFORMATION ON ALL THE NEW AND VITALLY IMPORTANT DIESEL DEVELOPMENTS — ORDER YOUR COPY OF THE DIESEL ENGINE CATALOG, VOLUME 10, TODAY.

\$10

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NOW

Here is the book you have been looking for — a book you need now and will use throughout the

coming year. Not a book to read and lay aside — but one to which you will frequently refer; — Design and operating engineers, Diesel students, purchasing and sales executives — in fact all who are

interested in Diesel engines, accessories and plant equipment, keep The DIESEL ENGINE CATALOG within reach all the time — because it is the Diesel "bible", a big book — 10 1/8" x 13 1/2" — 530 Pages and a really big value. Rex W. Wadman, editor, conceived the DIESEL ENGINE CATALOG as a "Cross Section of The Diesel Industry" — just that; and through ten consecutive editions the book has been greatly expanded each year to keep pace with the rapid growth of the Industry. This 10th edition, the largest and most complete of all, carries descriptions of more than 300 American-made Diesels with a large section devoted to Diesel engine accessories and plant equipment — a most useful and indispensable book.

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P. W. Ross, New Vice-President and General Manager of Southeastern Indiana Power Company

CARL L. CARTER, President of Southeastern Indiana Power Company, has announced the appointment of P. Waldo Ross as Vice-President and General Manager, effective February 11th. In bringing Mr. Ross into the Southeastern organization to direct our operating and maintenance activities, the system gains considerable strength in carrying out the previously planned long range construction program to handle its power load increases and serve several hundred new customers," said Carter.



P. Waldo Ross

A native son of Indiana," continued Mr. Carter, "Ross is well known throughout our state in the public utilities field. He is 45 years of age, attended our grade and high schools and received his university degree in electrical engineering at Purdue. His 20-year background, training and experience with major companies in the electric power and light industry in Indiana enable him to immediately assume his duties with us and advance our program with characteristic vigor and directness. His past experience as manager of rural distribution of electric power will aid especially in streamlining extensive programs already under way throughout our system."

All-Flex Ball Bearing Swivel Pipe Coupling

THE all-flex ball bearing swivel pipe coupling designed to solve one of the most critical problems in the transmission of hydraulic power—that of conveying fluids under high pressure through a pipe which swivels or rotates full 360 degrees.

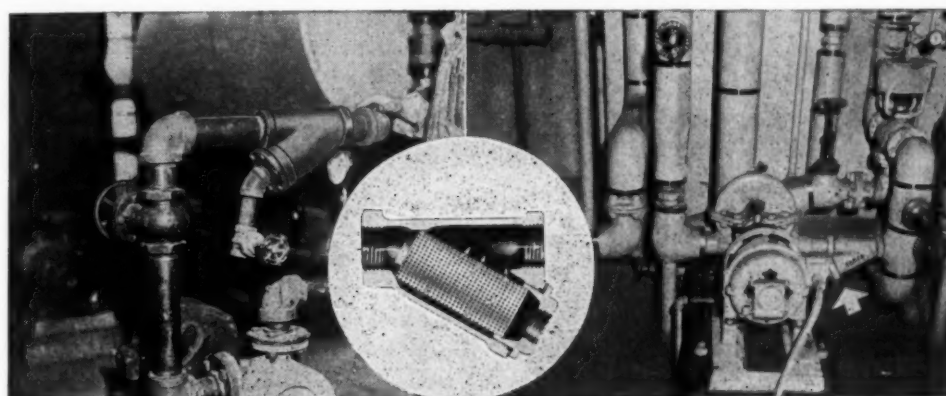
And now please turn to page 108 . . .

Skilled operation and diversified equipment, backed by 85 years of wide experience, enable Moran to carry out towing assignments, whether harbor, inland, coastwise or deep sea . . . with dispatch.



MORAN

Established 1860
TOWING & TRANSPORTATION
New York • New Orleans • San Francisco



Sarco strainer on fuel tank . . . Sarco strainer protecting water pump

SARCO STRAINERS FOR FUEL, LUBRICATING OIL AND WATER LINES

Shut downs due to foreign material in pipe lines are avoidable. In a few minutes, at little cost, a Sarco strainer with the exact mesh required can be inserted in any line.

Where the need for cleaning the strainer is frequent, Sarco hand or motor driven scraper strainers are available.

Four types in sizes 1/4 to 8" for pressures up to 900 lbs. Ask for Bulletin 1200.

SARCO SARCO COMPANY, INC.
475 Fifth Avenue, New York 17, N. Y.
SAVES STEAM SARCO CANADA, LTD. 85 Richmond St. W. TORONTO 1, ONT.

95A

Highest Quality Gaskets & Oil Seals by **FITZGERALD**

Gasket Craftsmen
for 40 Years

Gaskets of all types and materials to give reliable service under all Diesel operating conditions.

For full information write —

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Canadian FITZGERALD, Limited, Toronto

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SINCE 1906 **GASKETS**
THE LEADER IN THE DIESEL MARKET

*Pierce
Governors*

Standard Equipment
on the world's leading
Diesel Engines!

THE PIERCE GOVERNOR COMPANY, INC.
1603 OHIO AVE., ANDERSON, INDIANA

BURKE A-C-D-C GENERATORS

BURKE, not one of the biggest names in generator construction, but certainly one of the oldest, has always been known for quality rather than quantity. Today, with the spur to more power in a hurry, Burke quality goes into 24-hour production lines to provide Diesel Engine users with a husky well-built A.C. or D.C. Generator or Motor to meet any specified conditions up to 1000 K.W. or 1000 H.P. Write for specific information.

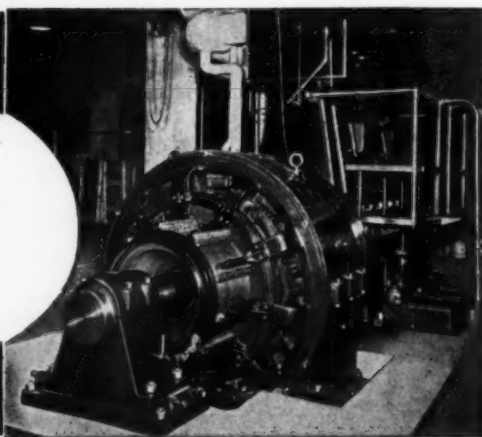
BURKE ELECTRIC CO Erie, Pa.



The All-Flex ball bearing swivel pipe coupling.

The combination of multiple synthetic packings and metallic seals offers absolute protection against leakage at high and low pressures, and forms the basis for a swivel coupling of long life and trouble-free performance. A double row of ball bearings, plus metal-backed packings, gives the lowest possible resistance to rotation, permitting ease of operation at high pressures. The unusual low torque performance is evidenced by tests of aircraft companies and governmental agencies, showing a torque of 2.5 inch pounds at 1500 psi. and 9.6 inch pounds at 3000 psi.

This precision-built unit is one of the most compact high pressure swivel pipe couplings on the market. It is preferably made of steel, and available in sizes from 1/8 inch to 1 inch nominal tube size with a variety of threaded and elbow connections to meet your particular application. It is the solution to the problem in your product design. For full particulars write the Snyder Sales Corporation, 5225 Wilshire Boulevard, Los Angeles 36, California.



OAKITE SHORT-CUTS to **Diesel cleaning**

Speeding and Simplifying Diesel Engine Overhaul

Diesel overhaul can be expedited by FIRST soaking parts in tank charged with recommended fast-working Oakite degreasing material. Sludge, oil, grease deposits are quickly softened and loosened... a light brushing and pressure rinse COMPLETELY remove them.

Parts cleaned the time-tested Oakite way can be inspected faster and with greater accuracy. Repair work can be started sooner... the job completed earlier! FREE details gladly sent on request.

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OAKITE *Specialized* **CLEANING**
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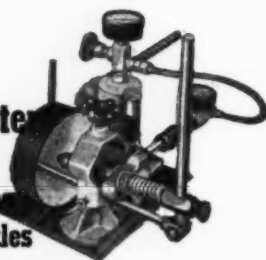
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WEST COAST DIESEL NEWS

By FRED M. BURT

AT Pete Storness' Harbor Boatyards, Vancouver, a 73 ft. halibut boat has been powered with the 155-hp. 6-cyl. Union Diesel that had powered the *St. Roch*, which in 1944, made the first round-trip conquest of the Northwest Passage.

SAN PEDRO BAY, Long Beach tuna seiner has had a 75-hp. Superior Diesel installed to operate refrigerating machinery; the *Discovery*, San Pedro, a 25-hp. Sheppard Diesel; *Star of San Pedro*, a new 25-hp. Hercules Diesel, for the same purpose.

THE 70 ft., all-steel, welded, refrigerated trawler, *Chirikof*, Seattle, has for main-power, a 180-hp. direct-reversible, Washington Diesel; and a 21-hp. Superior Diesel auxiliary. The boat's steel hull after assembling, was sprayed with molten zinc, an unusual feature.

STAR KIST, new flagship of French Sardine Co., Capt. Frank Perry, principal owner of the 131 ft. vessel, has for propulsion power an 840-hp. 6-cyl. super-charged Superior Diesel; auxiliaries, a pair of 200-hp., 6-cyl. Atlas Diesels, direct-connected to 156-kva. Fairbanks-Morse generators.

CAL-SEA, a purse-seiner converted to a tuna clipper, for California Sea Food Co., Long Beach, has a 275-hp. Atlas Imperial Diesel for main power; auxiliaries are two 150-hp. Cummins Diesels direct connected to 50-kw. Westinghouse generators.

TWELVE Columbia River bow picker type gill net boats, for The Meredith Fish Co., Sacramento, will be powered with 90-hp. Kermath-converted Hercules Diesels, purchased from the Beebe Co., Portland, Ore. Schulte Boat Works, Gardiner, Ore., builders.

THE 90 ft. cruiser *Los Cerritos*, San Pedro, has a new refrigeration system by Carrier-Freon,

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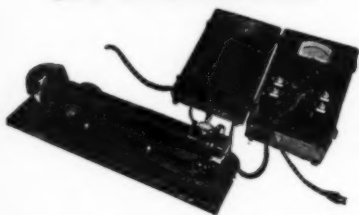
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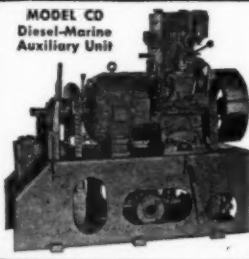
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engineered by Ralph E. Manns Co., Wilmington, powered by a pair of 7-hp. Hallet Diesels, for sharp-freezing of live lobsters. The vessel has also been repowered with two 225-hp. Gray Marine Diesels.

THE San Diego tuna clipper, *Genevieve H.*, fishing for High Seas Tuna Packing Co., is being repowered with a new 150-hp. Superior Diesel.

UNDER the supervision of Roy Wilson, San Diego manager for Shepherd Diesel Marine of Los Angeles, *Bernard Pedro*, baby tuna clipper, has been repowered with a 70-hp. Caterpillar Diesel, with 2:1 Twin Disc reduction gears.

THE *Portola*, a 90 ft. yacht powered with a 160-hp. Atlas Imperial Diesel, which saw service with the Coast Guard, has been purchased by Ralph Hemphill of the Hemphill Schools.

A SURVEY shows that 87,000 Pacific Coast citizens already own boats while boat-builders and boat-dealers have huge backlogs of orders for 1946 delivery. Compared with other commodities, no sharp rise in prices is expected.

YOUNG Brothers, Ltd., Honolulu, have placed an order for a new 600-hp. Fairbanks-Morse Diesel engine for their old tug *Mikioi*, its third power unit. A 600-hp. Eastern Standard gasoline engine was first used, then a Fairbanks-Morse "C-O" type, heavy oil engine.

THE Weldit Tank & Steel Wks., Bellingham, Washington, is building two steel, power scows, 80 ft. long, with twin-engine, twin screw 115-hp., Caterpillar Diesels; and two 40 ft. tugs, also twin screw, powered with 70-hp. Caterpillar Diesels. Designed by H. C. Hanson, the boats are for Pacific American Fisheries, Bellingham.

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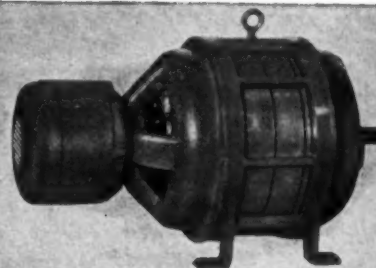
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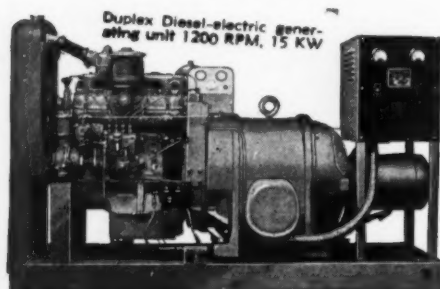
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